THE IRON TRADE REVIEW

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Ore Prices May Advance if Business Improves

But Furnace Men Are Not Convinced that Lowest Prices Have Been Named—Results of Settlement of Rebate Cases

Important and far reaching results are expected to follow two events of the past few days, the reduction in the quotations of Lake Superior ores and the ending of the rebate cases growing out of the handling of ore at lower lake docks. Lower prices on ore will be a factor tending to influence the market to recede to lower levels for deliveries after July 1, but if genuine prosperity should come this year, it would be a far greater factor and would completely overcome the influence of low prices on ore. In the rebate cases, technicality, disguised in the robes of justice, caused fines to be imposed on the Hanna and Pennsylvania railroad companies, while in the case of other defendants, genuine justice triumphed, and the result will be that favored shippers can no longer, as stockholders of companies operating docks, receive large profits which are tantamount to rebates. The policy of the interstate commerce commission, as clearly indicated by the letter of Commissioner Lane to District Attorney Denman, is to require the operation of docks by the railroads, or by companies whose stockholders are in no way interested as shippers.

Iron Ore

Buying of lake ores since the announcement of the new prices has been proceeding very slowly. Furnace owners are of the opinion that still lower prices may prevail, but ore sellers are hoping for higher quotations. As the market is absolutely uncontrolled, the advances and recessions so frequently noted in pig iron and finished material markets may be witnessed in iron ore. Owing to lower quotations and to the fact that conditions surrounding the foreign trade are unfavorable for shipment of ore to this country, Lake Superior ores have a better chance to sell in eastern markets this year than for a long time. Some sales have already been made in Cleveland and it is estimated that about a million tons of lake ore will go east this season. Prices of Port Henry, N. Y., ore are announced to be 7.25 cents per unit for 60 per cent ore and 7.9 cents per unit for 65 per cent ore, delivered in the Lehigh and Schuylkill valleys. Local New York and Jersey ores are selling at from 7¼ to 7½ cents for ore running from 56 to 58 per cent iron. Mesabi non-Bessemer ores can be delivered in the east at from 8.35 to 8.5 cents per unit.

Pig Iron

The pig iron market shows increased firmness, but buyers are already beginning to insist that for last half delivery they ought to be given lower quotations on account of lower prices having been named on lake ores. Discussions as to prices have developed the fact that last year large tonnages of lake ores were sold at much lower prices than generally known. Pig iron makers insist that the new prices are not much lower than concessions they were able to obtain last year and that it would be impossible materially to reduce prices of pig iron made from the new ore. Furnace men also point out that coke prices are higher and are likely to so continue. They say that the full effect of increased blast furnace capacity has not been felt except to keep prices down and that there is not enough coke capacity to meet the demands of the furnaces if any considerable number blow in.

Finished Material

The United States Steel Corporation is now running at slightly more than 90 per cent of maximum ingot capacity, which, taking into consideration works additions, indicates the highest rate of output in its history. There has been a general tendency toward hardening of price in finished materials, especially on bars, shapes and plates, on which the advance of $1 per ton is being generally obtained on strictly new business. Sheets are also firm at about $1 above the recent low quotations. The demand for light rails has been increasing steadily and quotations have been advanced $2 per ton. Track material is also in better demand. This is the usual season of great activity in wire products, and while the spring business is coming along rather slowly, the volume is now fairly satisfactory. In making new prices on finished products in the Chicago district, the Steel Corporation has been guided largely by local conditions. This shows the growing tendency to make Chicago a basing point as well as Pittsburgh.

PITTSBURGH

Prices On Finished Products Tend Upward

Office of THE IRON TRADE REVIEW,
2148-49 Oliver Bldg., March 26.

The iron and steel market during the past week has shown a steady, though limited improvement, as to both volume and better prices. The market on some finished products has advanced about $1 a ton, this gain being in a closer adherence to nominal market prices in many instances, while in some others it has been an actual advance. The excitement in the coke market is less noticeable, but indicates no weakness. Semi-finished steel is stronger, and buying more liberal. Railroads have appeared as buyers of cars. Light rails are increasing in activity, with production greater than at any time during this year. Plates are firm and specifications are increasing. Sheets have shown a better volume, and prices have firmed up considerably. Inquiries for structural material are more numerous, and the outlook is becoming more clearly defined as the season advances. The pig iron market, while firm, has not been so prolific of big orders, but there are signs of higher prices for third quarter delivery.

Pig Iron.—The pig iron market for the past week has been steady, and considerable quiet buying has been noted that has shown the prices to be well established, but there remains a round lot of basic to be placed, for which inquiries have been made. The demand for gray forge has become more active. Such furnaces as are running on this grade of iron appear to be well sold up and are very firm at $12.75, valley, the last sale of 1,000 tons being made at that figure. Foundry iron is also firm, one large sanitary interest practically taking up all the $13 iron it could find, and supplementing with $13.25 iron to the amount of 5,000 tons. A sale following this of 500 tons was made at $13.50, valley. An Ohio consumer took 3,000 tons of basic, securing the advantage of a nearby furnace for delivery, at $13.20, furnace, but other sales of less than 1,000 tons were reported at $13.25, and one inquiry for third quarter delivery was quoted at $13.50, valley. Bessemer is quoted at $14.25 and some sales were reported at this price, while third quarter is being quoted at $14.50, the highest price so far made this year. Malleable iron was closed at $13, and $13.25, in small lots, which seems to be the bottom of the market. We quote the market as follows:

(Prompt Shipment.)

Bessemer, valley	$14.25
Bessemer, Pittsburgh	15.15
Basic, valley	13.00
Basic, Pittsburgh	13.90
No. 2 foundry, Pittsburgh	14.15
Gray forge, Pittsburgh	13.65
Malleable, Pittsburgh	13.90

(Second Quarter.)

Bessemer, valley	$14.25
Bessemer, Pittsburgh	15.15
Basic, Pittsburgh	13.65
No. 2 foundry, Pittsburgh	14.15
Gray forge, Pittsburgh	13.65
Malleable, Pittsburgh	13.90

Ferro-Alloys.—There is practically no ferro-manganese for sale in the Pittsburgh market. While consumers are generally covered for six months to a year from last January, any new buyers are confronted with an absolutely barren market owing to the strike in Europe, which has shut off the fuel supply at manganese furnaces. A sale of a carload was reported this week at $60, but this is presumed to be a re-sale from a consumer having a good supply on hand. Prices are absolutely withdrawn, and while there is no quotation possible, with the recovery of normal conditions, it is believed that $41, Baltimore, will be the prevailing rate. The recent arrival at Baltimore of two cargoes is said to have finished up what stock there was to ship to this country, and this covers only consumers who are protected by contracts. The loss of one ship's cargo of about 3,000 tons also on contract consignments, which vessel is believed to have sunk with all on board some time ago, has forced buyers into the market who were supposed to have been protected by running contracts. This has left the situation complicated, and there has been considerable dealing between consumers for emergency stock. Fifty per cent ferro-silicon remains firm and quiet, the market not being sufficiently active to fix the price, but nominally it is $70 to $71. Domestic grades are unchanged.

We quote ferro-manganese nominally at $41, Baltimore, for prompt and forward delivery. The freight rate from Baltimore to Pittsburgh is $1.95 per ton.

Fifty per cent ferro-silicon is quoted nominally at $70 to $71, Pittsburgh, for prompt and forward delivery; 12 per cent, $22; 11 per cent, $21; 10 per cent, $20, f. o. b. Globe, Jisco and Ashland furnaces. The freight rate to Pittsburgh is $1.90. The foreign grades are held at $1 or more a ton over domestic prices.

Plates.—A decided improvement is noted in the steel plate trade, with a good line of inquiry for both new steel cars, ship plates and gas holders. Prices are held very firmly at 1.20c, Pittsburgh, on plates, and 1.15c on shapes, although efforts have been made to break this quotation during the past week. The Wabash railroad has placed an order for 2,494 cars, which have been distributed; 294 hoppers going to the Standard Steel Car Co.; 1,000 stock cars and 700 box cars going to the American Car & Foundry Co.; and 500 cars to the Haskill & Barker Car Co., with the further information that 1,000 more cars will be placed within a short time. The Bethlehem Steel Co. has placed a contract for a large gas holder, with the Western Gas Construction Co., Fort Wayne, Indiana, and about 1,200 tons of plates will be required. There are inquiries out for 3,000 tons of plates for two oil tank steamers for the Texas Oil Co.; for 1,000 box cars and 500 hoppers by the Seaboard Air Line; 1,800 cars for the Atlantic Coast Line, and 3,725 cars for the Atchison, Topeka & Santa Fe railroad. The Santa Fe is also asking for about 50 steel passenger coaches. Its freight car requirements are divided, with 1,250 box cars, 1,000 refrigerator cars, 200 automobile cars, 200 steel tank cars, 1,000 steel flat cars and 75 work cars. This inquiry is one of the largest appearing in some time. The market is also full of reports of additional car buying, indicating between 12,000 and 15,000 cars to be placed in the near future. A sale of 3,000 tons of plates was reported in the local market, though made by an eastern mill for delivery in New Orleans, and which, it is said, went at 1.15c, Pittsburgh base. The general impression seems of a decidedly firm market tone, and the productive capacity of the plate trade is regarded as better supplied with business than for many months. We quote the market as follows:

Tank plates, ¼ inch thick, 6¼ to 100 inches, 1.15c to 1.20c. Extras are as follows per 100 pounds: Boiler and flange steel plates, 0.10c; A. B. M. and ordinary firebox steel plates, 0.20c; still bottom steel, 0.30c; marine steel, 0.40c; locomotive firebox steel, 0.50c; all sketches excepting straight taper plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches, 0.10c; circles, 0.20c. Plates in widths over 100 inches up to 110 inches, 0.05c; over 110 inches up to 115 inches, 0.10c; over 115

inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches up to 130 inches, 0.50c; over 130 inches, 1c. Gages under ¼ inch to and including 5/16-inch plate on thin edge, 0.10c; under 5/16 and including No. 9, 0.25c. Five cents extra for less than carloads. Terms net cash in 30 days.

Sheets.—The withdrawal of the leading interest from the market for all business on galvanized sheets below 2.90c base, has had a good effect on the general trade and it is believed that, owing to the extreme high cost of spelter, the general trade will reach this basis of quotation. In black sheets there is a generally firmer tone, and 1.85c, base price, for No. 28 gage black sheets appears to be the bottom in Pittsburgh territory. At points west of Indiana, there is understood to be some lower prices being quoted, and it is claimed that as low as 1.70c, makers' mills, has been done at these points. This would be equal to about 1.85c, Pittsburgh. The sheet trade, as a whole, is firmer, and while somewhat "spotty" regarding prices, seems to be on the upward trend and getting stronger from week to week. Specifications are running very heavy, in fact, heavier than at any time this year. Car service has improved. We quote the market as follows:

Blue annealed sheets No. 10 gage, 1.35c to 1.40c; black annealed sheets, No. 28 gage, 1.80c to 1.90c; galvanized sheets, No. 28 gage, 2.80c to 2.90c; painted roofing sheets, $1.35 per square for No. 28 gage, 2½-inch corrugation; galvanized roofing sheets, $2.45 per square for No. 28 gage, 2½-inch corrugation, f. o. b. Pittsburg.

Tin Plate.—Better specifications are coming in for tin plate and while new business is seasonably quiet, the attitude of the manufacturers appears more settled on a firmer market, and there is less heard of the low quotations of a few weeks ago, which had dropped down to $3.30 per base box. A few independents and mills short on tonnage have taken business at $3.35, but the leading interest is holding firm to $3.40, and is getting considerable business at that price. The Washington Tin Plate Co., which has rebuilt its plant at Washington, Pa., at a cost of $200,000, is now operating in full its six mills and a modern tinning house, and has an annual capacity of 450,000 boxes. We quote the market as follows:

Coke tin plate, 100-pound basis, 14 x 20, $3.35 to $3.40, f. o. b. mill, Pittsburgh district.

Rails and Track Material.—The demand for light rails has increased steadily each week during the present month, and prices have become firmer, the general market being $2 higher per ton all down the line than a month ago. The leading interest quotes 12 and 14-pound sections at $1.20; 8 to 10-pound sections, $1.29½, as the new price; 16 to 45-pound sections remaining firm at $1.15, at which point it has been nominally placed for some months, though shaded frequently. Standard section specifications are ahead of February, which was the record month of the season. The run of small orders for these sections is very large. Many traction companies have come into the market for their annual requirements, bringing the aggregate of new business up to a high point. Generally, the standard railroads have finished contracting for their needs for the first half of the year, but it is believed that this is to be followed by a general buying for the second half. Track material is also in better demand, especially for angle-splice bars and track bolts, for which better specifying is now being done. The leading interest has ordered on an Ohio works rail mill on April 7 to run on open-hearth rails. This places every rail plant in operation in this district. The market is quoted as follows, and the base price on open-hearth steel rails 1.34c per pound at the mill.

Fifty-pound and heavier, 1.25c per pound; carloads and less than 500 tons, 1.34c per pound; light rails on base weight of 40 to 45 pounds, 1.15c, the schedule on the other weights being irregular and subject to negotiations; angle splice bars for standard sections, 1.50c, Pittsburgh; track bolts, 2.20c to 2.25c, Pittsburgh.

Railroad Spikes

4½, 5 and 5½ and 9-16	$1.40
3, 3½, 4, 4½ and 5 x ½	.10
3½, 4 and 4½ x 7/16	.20
3, 3½, 4 and 4½ x ⅜	.30
2½ x ⅜	.40
2½, 3 and 3½ x 7/16	.60
2 x 5/16	.80

Steel. — Specifications against contracts are running much heavier, and the market is much firmer than a week ago. There is even a scarcity reported in rolling billets. Some fairly active testing of the present prices has been going on during the past week, and has demonstrated that $20, Pittsburgh, for Bessemer and open hearth rolling billets is the bottom price prevailing, and $21 for Bessemer and $20.50 for open hearth sheet bars. While the demand for open hearth sheet bars is good, there is a continual offering of small lots by mills that at the present rate of running on finished material are unable to absorb their own production of sheet bars. This has the effect of holding down advances on this grade of sheet bars to a bottom position. The few producers of Bessemer sheet bars are holding very firm to $21, and are getting slight advances on prompt shipments. The larger producers are running on the best mill schedules of this season. The leading interest is still out of the market for both rolling billets and sheet bars, and is not offering any forging billets, which are firm at $28. We quote the market as follows:

Bessemer 4 x 4 billets with 0.25 carbon and less are quoted at $20, with the usual extras for size and analysis, and open-hearth rolling billets, $20; Bessemer sheet and tin bars are quoted at $21, and open-hearth sheet bars are quoted at $20.50 to $21, f. o. b. Pittsburgh, with full freight to destination added. Forging billets are quoted at 27 to $28, Pittsburgh.

Hoops and Bands. — Specifications are running very satisfactorily on hoops and bands, and shipments are going forward at a good rate with a gain over last week. There is less heard of the minimum price of 1.25c, and 1.30c appears to be nearer the bottom of the market at this time. Bands are firm at 1.15c.

Hoops in carload lots, 1.25c to 1.30c, Pittsburgh; in less than carload lots, 1.40c; bands, 1.15c, base, with net extras, as per standard steel.

Merchant Bars.—The recent action of the leading interest in placing a minimum of 1.15c on steel bars has been followed by very liberal specifying. Some extensive new business is being taken and mills are operating more fully than for a long time. The past week has witnessed a large tonnage coming out, and inquiries are increasing, while prices appear to have adjusted themselves to the new business without difficulty. The larger independents are also holding prices at the new minimum base, and report a very satisfactory demand with specifications running much heavier than for some time. Iron bars are still somewhat quiet, but specifications are a trifle more liberal, and prices remain unchanged. We quote the market as follows:

Common iron bars, 1.30c to 1.35c, Pittsburgh; Bessemer and open-hearth steel bars, 1.15c; plow and cultivator, 1.25c; channels, angles, zees, tees, under 3 inch, 1.25c, all f. o. b. mill. The following differentials are maintained on steel: Less than 2,000 pounds of a size, 0.35 advance. Cold rolled and ground shafting, 65 per cent off in carloads and 60 and 10 per cent in less than carloads, delivered in base territory.

Muck Bar.—The market for muck bar is practically stagnant. While there were rumored sales of 500 tons during the past week, they were not possible on verification. The leading producers are either not operating, or are on reduced schedule, and report no inquiries, but the market remains nominally unchanged as to price. We quote $28 to $29, Pittsburgh.

Structural.—There is a better tone to the structural market during the past week, owing to an increase in small order contracts, and a more

free specifying against contracts placed before-hand, while some inquiries are out that would appear unusually attractive if developed into actual busines. One of the local inquiries is for an indefinite tonnage for a new theater to be built at Penn avenue and Seventh street, in Pittsburgh. The American Bridge Co. has taken 2,000 tons of material for the Chicago, Milwaukee & St. Paul for bridge construction, and the Chicago & Northwestern has taken 3,000 tons from the same company. This material is for overhead crossings of highways. The air is full of talk of new work in contemplation, but much of it remains yet to overcome the financing difficulties before it becomes a definite feature of the trade. Prices are firm and mills are generally well supplied with business for some time ahead. We quote the market as follows:

Beams and channels, 15 inches and under, zees, 1.15c to 1.20c; tees, 1.15c to 1.20c; angles, from 3 to 6 inches, 1.15c to 1.20c; over 6 inches, 1.25c to 1.30c; universal and sheared, 1.20c to 1.25c; over 15 inches, 1.30c to 1.35c; plates, 6¼ inches wide and wider, 1.30c.

Merchant Pipe.—A feature of the past week in the pipe trade was the award of an extensive contract for from 65 to 70 miles of steel line pipe by the Philadelphia Co., of Pittsburgh, three Pittsburgh and one Ohio producers getting the order, which is for West Virginia delivery. There is a fair inquiry for small lots of pipe, running from carload lots to five or six miles, and merchant pipe is continuing in a fairly steady manner with firm prices. A good many complaints are heard of slow deliveries, owing to the severe weather, and much new business is held up because of the late season. We quote the official discount to jobbers subject to the usual preferential discount to the larger buyers, as follows:

Iron and Steel Pipe Basing Prices

	Steel.		Iron.	
	Butt weld.			
	Black.	Galv.	Black.	Galv.
⅛, ¼ inch	74	54	68	48
⅜ inch	75	65	69	53
½ inch	78	68	72	59
¾ to 1¼ inch	81	73	75	64
2 to 3 inches	82	75	76	65
	Lap weld.			
2 inches	79	72	72	63
2½ to 4 inches	81	74	74	66
4½ to 6 inches	80	72	73	65
7 to 12 inches	77	68	71	61
13 to 15 inches	55	..	47	..
Extra Strong, Plain Ends.				
	Butt weld.			
⅜, ¼, ⅛ inch	70	60	65	55
½ inch	75	69	70	63
¾ to 1¼ inch	79	73	74	65
2 to 3 inches	80	74	75	66
Extra Strong, Plain Ends.				
	Lap weld.			
2 inches	76	70	71	63
2½ to 4 inches	81	74	74	66
4½ to 6 inches	77	71	72	65
7 to 8 inches	70	60	65	55
9 to 12 inches	65	55	60	50
Double Extra Strong, Plain Ends.				
	Butt weld.			
½ inch	65	59	60	52
¾ to 1¼ inch	68	62	63	55
2 to 3 inches	70	64	65	57
Double Extra Strong, Plain Ends.				
	Lap weld.			
2 inches	66	60	61	52
2½ to 4 inches	68	62	63	57
4½ to 6 inches	67	61	62	56
7 to 8 inches	60	50	55	45

Plugged and reamed pipe is furnished at 2 points higher price, either butt or lap weld.

The above discounts are for full weight pipe, subject to a variation of 5 per cent, merchant pipe, when specified, being furnished up to 6 inches at one point higher discount (lower price.)

Boiler Tubes.—Mills running on boiler tubes are getting good specifications on contracts. Some new business is developing, which is keeping up the present rate of production and possibly increasing slightly from week to week shipments to leading consumers. The official discounts on charcoal and iron boiler tubes follow:

Steel

1¾ to 2¼ inch	65
2½ inch	67½
2¾ to 3¼ inch	72
3½ to 4½ inch	75
5 and 6 inch	67½
7 to 13 inch	65

Charcoal Iron

1½ inch	48
1¾ to 2¼ inch	50
2½ inch	55
2¾ to 5 inch	60

To destination east of Mississippi river will be sold at delivered discount for carloads lowered by 2 points, for lengths 22 feet and under; longer lengths, f. o. b. Pittsburgh. Usual extras to jobbers and boiler manufacturers.

Wire Products.—A decided improvement has taken place in specifications against contracts on wire and wire nails. Most of the producers are now operating their entire capacity, and report a brisk demand by the trade. All of the production based on the 1.50c price for wire and wire nails will be shipped by the end of the month. Considerable business is being done on the 1.55c base. New business, in view of the approach of spring with the most active season of the year at hand, is being done strictly on the basis of 1.60c for wire nails, and this price promises to hold now more firmly than was indicated a week ago. We quote the market as follows:

Wire nails, jobbers, carload lots, $1.60; retailers' carload lots, $1.65; cut nails (western makers), jobbers' carload lots, $1.55 to $1.60, painted barb wire, jobbers' carload lots, $1.60; retailers' carload lots, $1.65 with 30c for galvanizing; plain wire to jobbers in carloads, $1.40; and to dealers, in carloads, $1.45; polished staples, $1.60; galvanized staples, $1.90.

Wire Rods.—The demand for wire rods is slightly better, and prices are holding firm at $25.50 for prompt shipment, and $26 on contract for first half delivery. We quote $25.50 to $26, Pittsburgh, for Bessemer and open-hearth wire rods.

Coke.—The coke market continues very active, and prices are a shade higher and very firm, but sales are confined to comparatively small lots of both foundry and furnace grades, and contract coke is not apparently interesting the trade at this season. The severe shortage of cars for foundry coke has been an influence favorable towards higher prices, and as high as $3.25, ovens, was done during the past week on fair sized orders, although the bulk of the trade for foundry was $3. The demand for furnace coke is keeping up with a minimum of $2.25, ovens, and some sales are reported at a slightly higher figure. The existing conditions have forced business to be done largely from hand to mouth. A lack of cars for furnace coke prevented as satisfactory shipments for last week as during the prior week. The open weather has enabled an increase in production, which was not cared for by car supply. We quote standard Connellsville foundry coke at $3, for spot shipment, and on contract $2.90 to $3, ovens; on standard Connellsville furnace spot coke, $2.25, ovens, and contract coke, $2.20 to $2.25, ovens. The Connellsville *Courier* reports 31,883 ovens active, with a production of 408,237 tons for last week, compared with 31,055 ovens active with a production of 398,715 tons for the prior week.

Old Material.—The market for old material continues inactive, and prices are unchanged, but it is believed that an inquiry for any large tonnage might induce some shading of the present quotations. Large consumers are not willing to accept present values as definite and final. The Pennsylvania Railroad Co. has called for bids on April 2 on a round lot of scrap of about 25,000 tons, much of which is heavy melting stock. It is understood that buying will be quite active for this material. There are a few small sales reported, but these have had little effect on the market and have failed to test its real strength. We quote gross tons delivered in the Pittsburgh district, including Monessen, Steubenville, Brackenridge and Follansbee, as follows:

Heavy melting scrap	$12.75 to 13.00
Rerolling rails	13.00 to 13.50
Malleable	12.00 to 12.50
Bundled, sheet scrap	11.00 to 11.50
Iron axles	21.00 to 21.50
Old iron rails	15.00 to 15.50
Stove plate	9.00 to 9.50
No. 1 wrought scrap	12.50 to 13.00
Old car wheels	12.50 to 13.00
Low phosphorus	14.75 to 15.00
Machine shop turnings	9.75 to 10.25
Cast borings	9.50 to 9.75
No. 1 cast scrap	12.50 to 12.75

CHICAGO

Chicago a Basing Point---Pig Iron Improves

Office of THE IRON TRADE REVIEW,
1328 Monadnock Blk., March 26.

The leading interest has advanced its asking prices on finished materials and in this effort to improve quotations the larger independents are cooperating. The new figures are 1.30c, Chicago, on bars, 1.35c on plates and shapes and 3.08c on No. 28 galvanized sheets. These quotations have not yet been in effect a sufficient length of time to be tested and although a large volume of business is coming to the mills, it is practically all on old contracts at lower prices; also it is still possible to obtain finished material for prompt shipment at the old figures. In making its new prices in the Chicago district, the Steel Corporation is guided more by local conditions than by the Pittsburgh market and it will be noticed that the figures given above are 66 cents a ton under Pittsburgh quotations plus the freight of 18 cents per hundred pounds. Virtually the Chicago basing point has been recognized.

Pig Iron.—There has been some improvement in inquiry for foundry iron and sales are a little heavier, although in general the situation shows no special change. An Aurora foundry is in the market for 200 tons of southern iron for last half delivery and a Michigan manufacturer is inquiring for 500 tons for immediate shipment. A Wisconsin interest is in the market for 1,000 tons of northern iron. There is considerable inquiry for both southern and northern iron for shipment over the last half. The southern furnaces are quoting $15.10, Chicago, on third quarter deliveries and are not disposed to name prices for the fourth quarter. Local northern foundry irons remain unchanged at $14, f. o. b. furnace, and basic is quotable at about the same figure. For third quarter delivery, $14.50 is being asked. Two furnaces making foundry iron in the Milwaukee territory are expected to blow out in the near future.

The following prices are for Chicago delivery, except northern foundry and malleable Bessemer, which are quoted f. o. b. furnace:

(First Half Shipment.)

Lake Superior charcoal	$16.50
Northern foundry No. 2	14.00
Southern foundry No. 2	14.85
Southern silveries, 5 per cent silicon	15.60
Jackson co. silveries, 8 per cent	17.40
Malleable Bessemer	14.00
Alabama basic	14.85

Billets.—There is a fair demand for forging billets and prices are well maintained. The local makers are out of the market on rolling billets, each mill having need for all of the crude steel that it can produce. We quote, f. o. b. Chicago, open-hearth forging billets, $27, and re-rolling billets, $22.60.

Merchant Bars.—Sales of bar iron are improving and some mills are booked ahead for a couple of months. Prices, however, remain somewhat irregular and quotations as low as 1.12½c, Chicago, are obtainable. There is a better demand for hard steel; one of the mills in this district which has been shut down started up March 25, and another mill which has been running single turn changed to double turn this week. Specifications for soft steel bars continue heavy. The asking price of the leading interest is 1.30c, Chicago, although considerable tonnage is still available at 1.25c. Most of the business moving is on old contracts. The demand for shafting is somewhat better.

We quote, f. o. b. Chicago, as follows:

Bar iron, 1.15c to 1.20c; hard steel bars, rerolled, 1.17c to 1.20c; soft steel bars, bands and small shapes, 1.25c to 1.38c, base; hoops, 1.48c; smooth finished machinery steel, 1 inch and larger, 1.78c; shafting 60 per cent off list for carload lots, 55 per cent off for less than carloads.

On iron and steel from local stock, we quote as follows:

Bar iron, 1.50c to 1.60c per pound base; soft steel bars, 1.50c to 1.60c per pound base; soft steel hoops, 1.80c to 1.90c, full extras.

Structural Material.—Fabricators are asking higher prices. Continued heavy specifications have encouraged the mills to take a firmer stand and the minimum price quoted by the leading interest is now 1.35c, Chicago, although plain material is still obtainable at 1.30c. Since most of the business coming to the mills is on old contracts at low prices, the new quotations have not been tested and it will be some time before it can be determined whether the efforts of the manufacturers to advance the market have been successful. The Crown Iron Works has taken 136 tons for a shop building at the University of Minnesota, Minneapolis. The American Bridge Co. has been awarded 891 tons by the Crane Co., Chicago, for a new building. E. P. Jamison & Co., Seattle, have ordered 230 tons of rods and bolts. The St. Louis Southwestern railway has recently purchased considerable bridge material from the Phoenix Bridge Co., including one 355-foot draw span, two 54-foot girder spans and one 70-foot girder.

We quote mill prices, f. o. b. Chicago, as follows:

Beams and channels, 15 inches and under, 1.30c to 1.38c. For extras, see Pittsburgh report.

Plain material, out of stock, is as follows:

All angles, 3 inches and larger, including 6 inches, $1.60 to $1.65 per 100 pounds; angles over 6 inches, $1.70 to $1.75 per 100 pounds, base; beams, 3 to 15 inches, inclusive, $1.60 per 100 pounds, base; channels, 3 inches and larger, $1.60 per 100 pounds, base.

Rails and Track Fastenings.—The local rail mills are now operating on a fairly satisfactory basis, although they could take care of considerable more tonnage. The Rock Island has purchased 14,000 tons of rails from the Illinois Steel Co. and has also placed 2,000 tons with an independent mill. Makers are assuming a firmer attitude on the price of track fastenings and light rails, but these commodities are not quotably higher. On account of the severe winter, railroad tracks will be in a bad shape with the coming of mild weather and considerable repair work will be necessary.

We quote, light rails, f. o. b. Chicago, and track fastenings, f. o. b. Joliet, as follows:

Light rails, carloads, 40 to 45-pound, 1.16c to 1.20½c; 30 to 35-pound, 1.19½c to 1.24c; 16, 20 and 25-pound, 1.20½c to 1.25c; 12-pound, 1.25c to 1.29½c.

Light section relayers, 45 pounds and under, subject to inspection, $21 to $23; standard section relaying rails, subject to inspection, $23.50 to $24.

Track fastenings, f. o. b. Joliet, angle bars, 1.50c; railroad spikes, 1.50c to 1.55c, smaller size spikes, 1.65c, base; track bolts with square nuts, 1.90c base.

Plates.—The leading interest has

also advanced its asking price on plates to 1.35c, Chicago, but no sales of consequence have been made at this figure. Mills located in Ohio and western Pennsylvania continue to enter the local market with low prices although their efforts to get business are not as persistent as was the case a short time ago. The Santa Fe has entered the market with a definite inquiry for the following equipment: 1,250 box cars; 1,000 refrigerator cars; 200 furniture cars; 200 steel tank cars; 1,000 all-steel flat cars; 75 work cars; 15 smoking cars; 10 combination passenger and mail cars; 10 chair cars; 14 three-compartment Jim Crow cars and one combination passenger and baggage car. The St. Louis Southwestern is inquiring for 15 70-foot baggage cars; 12 70-foot mail and express cars and eight 70-foot chair cars.

We quote mill prices, f. o. b. Chicago, as follows:

Tank plates, ¼ inch thick, 6¼ to 100 inches wide, 1.30c to 1.38c. For extras, see Pittsburgh report.

Store prices are as follows:

Tank steel, ¼ inch and heavier, up to 72 inches wide, 1.60c.

Sheets.—There is a very good volume of business and prices are firmer all along the line, although greater difficulty is being met in maintaining quotations on galvanized than on black sheets. The local mills, however, continue in a very firm attitude regarding the former and are accepting no business below 3.03c, Chicago, for No. 28 gage. The movement of sheets out of stock is somewhat heavier. The plants both of the Inland Steel Co. and the American Sheet & Tin Plate Co. are operating at capacity.

We quote, store prices, f. o. b. Chicago, as follows:

Blue annealed, No. 10, 1.90c; No. 12, 1.95c. Box annealed, No. 28, 2.30c. Galvanized, No. 28, 3.35c.

For mill prices, see Pittsburgh report. Freight to Chicago, 18 cents.

Wire Products.—The wire mills are doing a good business in spite of weather conditions, which have been decidedly unfavorable. A rush is expected as soon as spring really arrives. The demand for electrical wire is in excess of that which prevailed a year ago. The nominal price remains 1.60c, Pittsburgh, for wire nails in jobbers' carloads, although most of the business is moving at $1 a ton less. Practically all of the orders at 1.50c, Pittsburgh, have been cleaned up.

We quote, f. o. b. Chicago, as follows:

Wire nails, jobbers' carload lots, $1.78; retailers' carload lots, $1.88; retailers' less than carload lots, $1.98; painted barb wire, jobbers' carload lots, $1.78; retailers' carload lots, $1.88; retailers' less than carload lots, $1.98, with 30c for galvanizing; plain wire, jobbers' carload lots, $1.58; retailers' carload lots, $1.63.

Merchant Pipe and Tubes.—The situation is showing some improvement and the increase in the demand for boiler tubes is more apparent. Prices are better. Specifications continue steady on merchant pipe but new business is still being obtained mainly in small lots. Prices have been advanced on galvanized pipe on account of the high price of spelter.

We quote, store prices, on merchant pipe and tubes, f. o. b. Chicago, as follows:

Iron and Steel Pipe Basing Prices

	Steel.		Iron.	
	Black.	Galv.	Black.	Galv.
Butt.				
⅛ inch and ¼ inch.	71.2	50.2	63.2	42.2
⅜ inch	75.2	64.2	66.2	55.2
½ inch to 1½ inch.	78.2	69.2	71.2	62.2
Lap.				
2 inch.	76.2	68.2	68.2	60.2
4½ inch to 6 inch..	77.2	68.2	69.2	60.2
Card Weight.				
7 inch to 12 inch...	74.2	63.2	67.2	56.2
Extra Strong Plain Ends.				
Butt.				
⅛, ¼, ⅜ inch.....	66.2	54.2	60.2	48.2
½ inch	71.2	59.2	65.2	53.2
2 inch to 3 inch...	76.2	64.2	....	....
Lap.				
2 inch	72.2	60.2	66.2	54.2
7 inch to 8 inch....	66.2	54.2	60.2	48.2
Double Extra Strong.				
Butt.				
½ inch	59.2	47.2	....	....
¾ inch to 1½ inch.	62.2	50.2	....	....
Lap.				
2 inch	60.2	48.2	....	....
4½ inch to 6 inch..	61.2	49.2	....	....
7 inch to 8 inch....	54.2	42.2	....	....

Tubes

	Lap weld steel.	Charcoal iron.	Shelby seamless.
	Per cent.	Per cent.	Per cent.
1 inch	39	..	57½
1¼ to 2¼ inch.....	55	40	35
2¾ to 3¼ inch.....	65	50	46
3½ to 4½ inch.....	67½	50	46
5 to 6 inch.....	55	..	..

Cast Iron Pipe.—The week under review was comparatively quiet in the cast iron pipe market. The American Cast Iron Pipe Co., Birmingham, Ala., has been formally awarded 10 miles of 4, 6 and 8-inch pipe at Council Bluffs, Ia.

We quote, f. o. b. Chicago, as follows:

Four-inch water pipe, $26.50; 6 to 12 inches, $24.50, larger sizes, $24; gas pipe, $1 a ton higher.

Old Material.—Generally improved conditions have helped the scrap market and price advances ranging from 25 to 50 cents a ton are noted on a good many items. Deliveries are better and melters, therefore, are not obliged to buy as heavily at present as was the case a short time ago in order to get a sufficient tonnage. There is considerable railroad business pending, including a list of 1,500 tons from the Rock Island, on which bids close March 28, and 3,831 tons from the Great Northern, on which awards will be made March 29. The latter list includes 450 tons of frogs and switches; 260 tons of malleable castings, 650 tons of re-rolling rails and 247 tons of No. 1 railroad wrought. wrought.

We quote for delivery in consumers' yards, Chicago, as follows:

Gross Tons

Old car wheels	$13.00 to 13.50
Old iron rails	15.00 to 15.50
Rerolling rails (5 ft. and over)	12.50 to 13.00
Old steel rails (3 ft. and under)	11.75 to 12.25
Frogs, switches and guards	11.00 to 11.50
Heavy melting steel	11.00 to 11.50
Shoveling steel	10.50 to 11.00

Net Tons

No. 1 R. R. wrought	$11.25 to 11.75
No. 2 R. R. wrought	10.25 to 10.75
Arch bars and transoms	14.00 to 14.50
Knuckles, couplers and springs	10.75 to 11.25
Shafting	14.00 to 14.50
Iron car axles	18.50 to 19.00
Steel car axles	15.50 to 16.00
Locomotive tires	13.50 to 14.00
Dealers' forge	9.50 to 10.00
Pipe and flues	8.25 to 8.75
No. 1 cast	11.25 to 11.75
No. 1 busheling	9.00 to 9.50
No. 2 busheling	6.50 to 7.00
No. 1 boiler cut	7.75 to 8.25
Boiler punchings	12.50 to 13.00
Cast and mixed borings	6.00 to 6.50
Machine shop turnings	6.75 to 7.25
Railroad malleable	10.75 to 11.25
Agricultural malleable	9.75 to 10.25
Angle bars, splices, etc., iron	12.75 to 13.25
Angle bars, steel	10.50 to 11.00
Stove plate and light cast scrap	9.75 to 10.25

Final Announcement

Announcement No. 3, containing information on the program, excursions and factory visits which have been arranged for the members of the Eighth International Congress of Applied Chemistry, to be held Sept. 4 to 13, has been sent out by the secretary, Bernhard C. Hesse, 25 Broad street, New York City. Members who desire to take part in the various tours which have been arranged are especially requested to notify the American committee as soon as possible since some of the reservations will have to be disposed of entirely before May 15. In addition to a detailed description of these tours, the announcement contains lists of officers and committee members, a hotel guide, rules on the presentation, discussion and publication of papers, directions to guests from abroad, and other information. The present announcement is the last to be issued before the holding of the congress.

Bids will be received about April 1, by Albert Annis, architect, 155 North Clark street, Chicago, for the erection of a five-story manufacturing building, 80 x 400 feet, which will be equipped with considerable power transmission machinery and elevators.

CINCINNATI

Tennessee Furnaces Advance Pig Iron Quotations

Office of THE IRON TRADE REVIEW,
503 Mercantile Library Bldg., March 26.

Pig Iron.—There is a gradual tendency towards better conditions in the local pig iron market. The feature of the past week was the action taken by most of the Tennessee furnaces when they notified Cincinnati dealers on March 22, that, following the lead taken by Birmingham producers a few weeks ago, they had advanced the price of southern foundry No. 2 iron to a $10.50, Birmingham, basis. These Tennessee makers have been practically the only ones that have recently quoted $10, Birmingham, as a basis for their iron, and consequently the southern situation is more firmly established at a higher level. All Alabama grades, except a small lot of resale iron, which had no effect on the market, have been based upon the higher quotation for some time. The Tennessee advance has not been tested, however, as there have been no sales or inquiries of any importance since then, and whether it will hold in an active market is a matter of conjecture. No trouble is predicted along these lines, one argument being that freight rates from Tennessee producing centers to Cincinnati are less than from Birmingham, which in itself, is a decided advantage. Only one large Tennessee producer declines to accept the full advance of 50 cents a ton until fully confirmed by developments, and is asking $10.25, which can be given as the minimum quotation. Southern Ohio foundry No. 2, which advanced from $13 to $13.50, Ironton, last week, is holding well at that price, and sales aggregating from 3,000 to 3,500 tons are reported by local dealers to have been made at the higher figure. Several offers ranging from $13.25 to $13.40, Ironton, have been refused by the furnaces, and if any sales have been made at these prices, it is because commissions have suffered. This is reported to have been true in one or two instances. The market has also been featured during the past few days by a lull in buying and selling in large lots, but this condition could be expected following the advance in prices. Inquiries and sales cannot be said to be fewer, but as a rule are in smaller lots, averaging from 200 to 500 tons. Generally speaking, furnaces do not care much at present whether or not any sales are made, because they are pretty well taken up with orders for about two months, and the threatening conditions that would follow the pending strike in the coal fields, together with the unsettled market, naturally would make it a poor business policy to push matters at this time. Buyers also are simply waiting for things to settle. Practically the only inquiries of any size in the market include 1,200 tons of southern charcoal iron for April, May and June delivery, to be shipped to an eastern Pennsylvania melter, and 3,000 tons of malleable from a Michigan user for third quarter shipment. No large sales are reported to have been made since last report. With freight rates from Birmingham $3.25, and from Ironton $1.20, we quote Cincinnati prices as follows:

Southern foundry No. 2	$13.50 to 13.75
Southern foundry No. 3	12.75 to 13.25
Southern foundry No. 4	12.50 to 12.75
Southern gray forge	12.50 to 12.75
Mottled	12.25 to 12.50
Southern No. 1 soft	13.75 to 14.25
Southern No. 2 soft	13.25 to 13.75
Standard southern car wheel	25.25 to 25.50
Northern No. 2 foundry	14.70
Northern No. 3 foundry	14.20
Northern No. 4 foundry	13.95 to 14.20
Jackson co. 8 per cent silicon	16.45 to 16.95

Coke.—The coke market is still rather unsettled, and prices have advanced again during the past week, although not so rapidly. The supply, which has been extremely short for some time, is being further lessened by the fact that some dealers are finding it more profitable to sell their coal at the advanced prices than to make coke from it. Either coal or coke, loaded ready for shipment, can be sold almost at any price the dealer may ask, and quotations also vary, depending upon how soon the supplies can be shipped. Users are still endeavoring to store up more than the usual requirements, because of the pending strike in the coal fields, which threatens to further shorten supplies, but are not being furnished the shipments they desire. The railroad situation is not improved, and what coke is being shipped is being forwarded in any kind of car that is available. One local dealer reports contracts aggregating 50,000 tons made this month. Because of changing conditions, exact prices cannot be given, but we quote as nearly as possible from the leading coke-producing districts as follows:

	Prompt shipment.	Contract second half.
Connellsville district:		
Foundry coke	$2.75 to 3.25	$2.65 to 3.00
Furnace coke	2.00 to 2.50	1.90 to 2.40
Wise county district:		
Foundry coke	$2.45 to 3.00	$2.40 to 2.75
Furnace coke	1.90 to 2.25	*Sliding [scale basis
Pocahontas district:		
Foundry coke	$2.75 to 3.00	$2.40 to 2.75
Furnace coke	2.50 to 2.75	2.00 to 2.50
New river:		
Foundry coke	$2.50 to 3.45	$2.50 to 3.40
Furnace coke	2.25 to 2.50	2.15 to 2.40

*Sliding scale basis means $1.60 for coke based on $9, Birmingham, for pig iron, with an advance of 16 2-3 per cent of the amount over $9 which pig iron is quoted. This is the usual basis. Other forms of sliding contracts are also made.

Finished Material.—Business is generally reported better. Steel bars are strong at 1.15c, structurals at 1.20c and plates at 1.20c, Pittsburgh. The local sheet mill is doing a good business at its recently advanced prices which include the following, all f. o. b., Pittsburgh: Black sheets, No. 28, 1.85c to 1.90c; galvanized sheets, No. 28, 2.85c to 2.90c; blue annealed sheets No. 10, 1.40c. New plans of the Cincinnati Car Co., Cincinnati, call for a new shop building, 400 x 450 feet, at Winton Place, that city, but specifications have not been prepared as yet. The Louisville & Nashville railroad has notified local contractors that it will build a large depot at Pensacola, Fla., and that it prefers to have northern firms as bidders for the work. The Cincinnati Precision Lathe Co. is building a new factory building in Mt. Washington, a suburb, and the Norwood Machine Co. is about to begin work upon a new plant on Main street, Norwood. The L. Schriber & Sons Co. have been awarded the contract for the new addition to the Hauck Brewing Co., this city, and the structural steel, 175 tons, has been taken by the Bethlehem Steel Co. For mill prices, see Pittsburgh report.

Warehouse business has not been so good during the past week, but today's sales indicate much better conditions for the next few days. Demands are general, which shows that users are not carrying any stock, but are buying supplies as they need them. Prices are unchanged, and we quote

for warehouses, f. o. b., Cincinnati, as follows:

Steel bars, 1.60c base; iron bars, 1.55c to 1.60c base; structurals, 1.70c base; plates, ¼ inch and over, 1.70c base; sheets, blue annealed, No. 10, 1.90c base; rivets, cone head, 2.25 base; cold rolled shafting, 60 per cent discount; boiler tubes as follows: 1¾ to 2¼ inch, 61 per cent discount; 2½ inch, 63 per cent discount; 2¾ to 3¼ inch, 66 per cent discount; 3½ to 4½ inch, 68 per cent discount; and 5 to 6-inch, 61 per cent discount; and soft steel cold twisted concrete bars, cut to length as follows: ¾ inch square and larger, 1.70c; ⅝ inch square and larger 1.80c; ½ inch square and larger, 1.90c; ⅜ to ⅜ inch square and larger, 2.10c; ¼ inch square and larger, 2.20c to 2.30c.

Old Material.—Conditions in the scrap iron market are slightly better than they have been for some time. Heavy melting steel seems to be in fair demand, but business is generally being rather evenly distributed among the different items. No large deals have been closed during the week, and there are no large lists reported pending. A small sale of bundled sheet iron recently brought $7, but it was hardly large enough to have much effect upon the market. According to a summation of reports, prices are as follows:

Gross Tons

Old iron rails	$12.00 to 13.00
Old steel rerolling	11.00 to 11.50
Old iron axles	18.00 to 18.50
Steel melting scrap	9.50 to 10.50
Car wheels	10.50 to 11.00

Net Tons

Old No. 1 R. R. wrought	$10.50 to 11.50
No. 1 machinery	10.00 to 10.50
No. 1 busheling	8.00 to 9.00
Stove plate	6.25 to 7.00
Machine shop turnings	5.50 to 6.00
Cast borings	4.25 to 5.00
Grate bars	6.00 to 7.00
Sheet iron, bundled	6.75 to 7.75
No. 1 cast scrap	10.00 to 10.50
Heavy turnings	6.00 to 7.00

CLEVELAND

Iron Ore is Sold for Eastern Delivery

Office of THE IRON TRADE REVIEW,
Penton Bldg., March 26.

Iron Ore. — Since the announcement of the new prices on iron ore, showing the reduction of 65 cents on non-Bessemer and 75 cents on Bessemer, there has been some buying, but furnaces are not showing any disposition to contract for large tonnages. Some buyers are not satisfied that the lowest prices have yet been named, and there is a general confidence among them that prices will not be higher. Sellers, however, are hopeful not only that present prices will be maintained, but also that somewhat higher quotations will prevail later in the year, as was the case in 1904, when the lowest prices in the past 13 years prevailed. Comparison of prices of old range Bessemer ore and Bessemer pig iron for the period 1903-1912 shows that the decline in the price of ore for 1912, compared with 1911, is 16.7 per cent, the largest percentage of decline during the period. On the other hand, the price of Bessemer pig iron, taking the quotation at the time of the fixing of the price of ore, shows the smallest percentage of decline during the period named. Prices and percentages have been as follows:

Year.	O. R. Bes.	Rise or Decline In Price.	Rise or Decline In per cent.	Bessemer Pig Iron.	Rise or Decline In Price.	Rise or Decline In per cent.
1903	$4.50			$21.50		
1904	3.25	—$1.25	—27.8	13.35	—$8.15	—37.9
1905	3.75	+ .50	+15.4	15.50	+ 2.15	+16.1
1906	4.25	+ .50	+13.3	17.25	+ 1.75	+11.3
1907	5.00	+ .75	+17.6	21.50	+ 4.25	+24.6
1908	4.50	— .50	—10.0	16.00	— 5.50	—25.6
1909	4.50	...	....	14.75	— 1.25	— 7.8
1910	5.00	+ .50	+11.1	19.00	+ 4.25	+28.8
1911	4.50	— .50	—10.0	15.00	— 4.00	—21.1
1912	3.75	— .75	—16.7	14.25	— .75	— 5.0

Perhaps the most interesting development of the week, next to the naming of the prices, was the sale of 30,000 tons of lake ore for shipment to an eastern buyer, at about 8½ cents, delivered. Sellers of lake ore are very hopeful that with the new prices they will be able to sell a million tons of ore to eastern consumers during the season. Up to date, contracts have been made for moving about a million tons of ore on the basis of 45 cents, net, from the head of the lakes. It seems probable that this will be the prevailing rate for the season. All the leading vesselmen say that they have not made any contracts at lower rates than were paid last year, when the prevailing rate was 45 cents, net, although some tonnage was tied up at 40 cents.

On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer, we quote as follows: Old range Bessemer, $3.75; Mesabi Bessemer, $3.50; old range non-Bessemer, $3.05; Mesabi non-Bessemer, $2.85.

Pig Iron. — A sale of 1,500 tons of foundry iron has been made for delivery the last half of the year at $13.50, furnace, and a considerable tonnage for the same delivery is pending. Furnaces are firmer in their quotations and buyers somewhat more willing to pay higher prices. We quote, delivered in Cleveland, as follows, the higher quotations, when given, being for last half delivery, while the lower quotations are for the first half of the year:

No. 1 foundry	$13.75 to 14.00
No. 2 foundry	13.25 to 13.50
No. 2 southern	14.35 to 14.60
Gray forge	12.50 to 12.75
Bessemer	15.15
Lake Superior charcoal	16.50
Jackson co. 8 per cent silvery	17.05

Coke. — Foundry coke is still being sold at $3.15 for prompt delivery, and there is a good demand. Neither sellers nor buyers are anxious to contract. Stock coke is practically unobtainable. The last quotation was $2.15. Less difficulty is being experienced in obtaining cars and deliveries have improved. We quote:

Connellsville furnace coke, $2.25 to $2.35 for prompt delivery, and $2.25 on contract; Connellsville foundry coke, $3.15 for prompt, and $2.60 on contract.

Finished Material. — New business and specifications are satisfactory and prices are slowly hardening. Leading independent mills are showing a disposition to follow the Carnegie Steel Co. in its advance to 1.15c, Pittsburgh, on bars and 1.20c on shapes and plates, and 1.15c seems to be the minimum on bars. There is, however, some business in all these products still being done at lower quotations, which were made to customers before last week. Sheets are stronger, the prevailing quotations being 1.80c, Pittsburgh, on No. 28 black, 1.35c on No. 10 blue annealed and 2.85c on No. 28 galvanized.

Old Material. — With the larger offerings of heavy melting steel in this market by dealers, an unmistakably weaker tendency has developed. Consumers of heavy steel in this city are generally fairly well covered and are not interested just at this time. Rolling mill scrap is not in demand, the

mills not running on satisfactory schedules. We quote, f. o. b. Cleveland, gross tons, largely nominally, as follows:

Gross Tons

Old iron rails	$14.00 to 14.50
Old steel rails (under 6 ft.)	11.25 to 11.75
Old steel rails (over 6 ft.)	11.50 to 12.00
Relaying rails	19.50 to 20.00
Old car wheels	11.50 to 12.00
Old steel boiler plate	9.50 to 10.00
Malleable iron (railroad)	11.00 to 11.50
Steel axles	17.00 to 17.50
Axle turnings	8.50 to 9.50
Malleable iron (agricultural)	10.00 to 10.50
Heavy steel	11.00 to 11.50
Country mixed steel	9.00 to 9.50
Bundled sheet scrap	7.50 to 8.00

Net Tons

No. 1 R. R. wrought	$11.00 to 11.50
No. 1 busheling	9.00 to 9.50
No. 1 machine cast	10.75 to 11.25
No. 1 dealers' wrought	9.00 to 9.50
Machine shop turnings	7.25 to 7.50
Pipes and flues	8.00 to 8.50
Wrought drillings	7.25 to 7.50
Stove plate	9.00 to 9.50
Cast borings	7.00 to 7.25
Wrought iron piling plate	15.50 to 16.00
Wrought iron arch bars	14.50 to 15.00

PHILADELPHIA

Prices of Finished Materials Slowly Hardening

Office of THE IRON TRADE REVIEW,
Philadelphia, March 26.

More promising conditions are being maintained in the eastern iron and steel market. A heavier tonnage in finished lines recently taken and which continues, is clearly asserting itself in increasing steel-making operations among eastern mills. Finished prices incline towards higher levels, but some irregularities still remain. Caution with both buyers and sellers marks the pig iron situation, neither being willing to commit themselves against the future. There is unevenness in price advances asked for iron. Scrap is selling a little more freely.

Pig Iron. — There is a quickened note to the market arising from the attitude of both maker and consumer, but conditions are still unsettled and the real strength of the situation remains indefinite. Buyers who have been closing for their requirements at easy stages are apparently being stirred by the coal and coke situation and are more disposed to negotiate for forward iron, but they show a purpose to do this guardedly and not excite the market or give any support for price advances. The furnaces are still acting with care. Most of them decline to commit themselves on iron before July 1, and some of them will sell for only nearby delivery. On the other hand, one or two eastern Pennsylvania makers, presumably well covered on their coke, have sold through the third quarter at little or no advance over present levels. Lehigh and Schuylkill valley makers show a general purpose to withdraw their minimum prices and to quote on a basis of $14.25 to $14.50, furnace, for No. 2X, or $15 to $15.25, delivered, Philadelphia and vicinity, but other eastern brands are still selling below these prices and the spread of values is not greatly altered. The leading Virginia maker remains generally out of the market, though it has made some prompt sales at advances, and this fact has directed an increased volume of orders to several makers there who have not changed their former schedule of $12.50, furnace, for No. 2X. One of these closed about 10,000 tons in the past week. A Virginia pipe maker has been buying iron from several furnaces in Virginia and in the Birmingham district. The Pennsylvania railroad is inquiring for 1,200 to 2,400 tons of charcoal, 250 to 500 tons of No. 2X and 500 to 1,000 tons of No. 4 for Altoona for second quarter. An Altoona consumer has bought about 1,000 tons of mill forge. In basic, a Harrisburgh steel maker is sounding out the market on 2,500 to 10,000 tons for third quarter. A Cumberland, Md., consumer is out for 1,500 tons of basic for second quarter. Basic is untested at $14.25, delivered, as there have been no recent sales. A Philadelphia buyer is inquiring for 500 tons of malleable for April. A Lehigh valley steel maker has come out for several thousand tons of low phosphorus iron. The 2,000 tons of this grade for a western Pennsylvania steel maker and the 2,275 tons for the General Electric Co. are credited by report with having gone to Lebanon district makers.

We quote, for prompt and second quarter shipment, in Philadelphia and vicinity:

No. 1X foundry	$15.25 to 15.50
No. 2X foundry	14.75 to 15.25
No. 2 plain	14.50 to 14.75
Standard gray forge	14.00 to 14.25
Basic	14.25
No. 2X Virginia	15.30 to 15.50
No. 2 southern	14.75 to 15.00
Standard low phosphorus	19.00 to 19.25

Finished Material. — Substantial evidence of better conditions recently among eastern steel makers is given in the increases being made in active steel works and finishing capacity. The Lukens Iron & Steel Co. started several additional open-hearth furnaces this week, the Phoenix Iron Works has put on another steel-making furnace and the Alan Wood Iron & Steel Co. has recently fired two furnaces, making six operating out of nine, and is working its blooming mill double time. The rail mill and Bessemer steel plant of the Maryland Steel Co., at Sparrows Point, resumed last week with good prospects for a favorable run. The Steelton plant of the Pennsylvania Steel Co. is operating at about 75 per cent of full steel capacity. Other eastern mills have felt in a similar way the recent increase of tonnage that has come to them and which, with some companies, reached the highest mark the past week.

Prices tend to slowly harden. Eastern shape and plate makers both report having entered some small orders at 1.20c, Pittsburgh base. The market for sizable lots remains at 1.15c, Pittsburgh, or 1.30c, Philadelphia, however, and as late as this week shape business for immediate shipment was accepted considerably below this level, or on a basis of 1.15c, eastern mill. Steel bars range from 1.10c to 1.15c, Pittsburgh. Bar iron is a little stronger and inclines more toward a 1.25c, Philadelphia, minimum. Eastern makers have no trouble to get $20, Pittsburgh base, for open-hearth rolling billets, and $25, Pittsburgh, for forging billets. A good demand for semi-finished steel is current. Buyers are making considerable effort to contract, but eastern mills will usually not accept such business at present prices beyond July 1.

New structural work is light. Decision is expected soon on the Vendig hotel, this city, 1,600 tons, upon which bids are in. Designs are being submitted for a machine shop for the Cramp shipyard, 1,000 tons or more. The Interstate building, Washington, is being shaped for bids.

We quote, delivered in Philadelphia and vicinity, as follows:

Plain structural shapes, 1.25c to 1.30c; tank

plates, 1.25c to 1.30c; steel bars, 1.25c; common bar iron, 1.22c to 1.27c; cut nails, 1.65c to 1.70c; blue annealed sheets, No. 10 gage, 1.50c to 1.55c; 4 x 4-inch open-hearth rolling billets, $22.40 to $23.40; forging billets, $26.40 to $27.40. Extras shown under Pittsburgh report.

Shipbuilding Work — Uncertainties in the way of national legislation on Panama canal tolls and agitation in congress against the co-ordination of railroad systems with steamship lines, are having a deterrent effect upon the closing of a heavy volume of new ship construction pending in the east. The four large boats for the Pacific Mail Steamship Co. are still held up, as well as several boats for the American-Hawaiian Steamship Co., additional to the five now building. Other projects are being delayed.

The Grand Trunk railroad has authorized the construction of two 5,000-ton steamships for a line between New York and Providence.

Old Material. — Recent improvement of tone in the scrap market is now developing into a better volume of sales, and in some grades these have been made at advanced prices. Small sales of railroad steel at $12.50, delivered, continue to be reported, but the mills are not openly offering over $12, delivered. Eastern works still show no interest in tonnage lots. Scarcity of low grade pig iron is causing eastern cast iron pipe makers to enter the scrap market more freely and several small sales of cast scrap at prices running up to $13.40, delivered, have been done. The iron mills have been buying some wrought material. An eastern steel maker has bought 1,000 tons of stove plate at $10, delivered, which seems to have cleared up much of the cheaper material.

We quote, gross tons, delivered in eastern Pennsylvania and New Jersey territory, as follows:

Old iron rails	$15.75 to 16.25
Old steel rails (rerolling)	13.00 to 13.50
No. 1 heavy melting steel	12.00 to 12.50
Old car wheels	12.50 to 13.00
Old iron axles	22.00 to 23.00
Old steel axles	17.00 to 17.50
No. 1 railroad wrought	14.50 to 15.00
Wrought pipe	12.00 to 12.50
Cast borings	9.00 to 9.50
Machine shop turnings	9.00 to 9.50
Heavy cast	13.00 to 13.50
Malleable	11.00 to 11.50
Stove plate	10.00 to 10.50

Freight rates per ton on scrap from Philadelphia to principal eastern consuming points are: $0.60 to Ivy Rock, Pa.; $0.65 to Phoenixville, Pa.; $0.80 to Coatesville, Pa.; $0.85 to Bethlehem, Pa., Reading, Pa., and Roebling, N. J.; $1.10 to Pottsville, Pa., Lebanon, Pa., and Columbia, Pa.; $1.20 to Harrisburg and Steelton, Pa.; $1.40 to Milton, Pa.

NEW YORK

Buyers Want Pig Iron, But Boost Higher Prices

Office of THE IRON TRADE REVIEW,
1115 West Street Bldg., March 26.

Pig Iron.—The consuming trade is apparently now fully awake to a realization that present prices will not be long continued in the event there is a strike or suspension in the coal regions April 1. They continue to enter the market quite freely, though they are slow to pay higher prices asked by different makers. The reduction of lake ores is being used by some buyers as an argument to off-set the effect of the higher coke prices, but furnacemen declare these reductions have been fully discounted. While in some directions recent low levels are being repeated even for third quarter, Eastern Pennsylvania, Buffalo and Virginia sellers are asking more for their iron and these advances on the average are about 25 cents. There are some coke shortages in the east and unless relief comes quickly, some furnaces in the Lehigh Valley and nearby districts may be obliged to bank. A soil pipe interest has closed for 3,000 of No. 2 plain from a western New York furnace for third quarter shipment to an upstate plant and is negotiating for 2,000 to 3,000 tons for delivery at its Newark plants. An up-the-river stove maker has bought 1,000 tons of No. 3 iron for early delivery. Two Brooklyn buyers have closed, one for 500 tons of No. 2X and the other for 1,000 tons of the same grade, both for second quarter, at about $15.20, delivered, which is a slightly higher price for such shipment. A New Jersey boiler maker is inquiring for 3,000 to 5,000 tons of No. 2 plain for delivery most satisfactory to the maker. Another Jersey buyer is out for 600 tons of No. 2X. Considerable malleable inquiry has quietly come out and probably 5,000 to 10,000 tons of this grade are now pending from leading buyers in New Jersey and New England. Malleable iron recently sold in New England at $15.95, delivered. Quiet inquiries of size are also being put out by some other large buyers. We quote for prompt and second quarter shipment at New York tidewater, Virginia and Southern iron being given at New York docks as follows:

Northern foundry No. 1	$15.20 to 15.45
No. 2 foundry	14.70 to 15.20
No. 2 plain	14.50 to 14.60
No. 2 Virginia	15.30 to 15.85
No. 2 southern foundry	14.50 to 14.75
Malleable	15.25 to 15.50
Gray forge	14.00 to 14.25

Ferro-Alloys. — Shortages of ferro-manganese have become more numerous among consumers, and in the east bareness of stocks with some steel makers have caused apprehension. The arrival of several cargoes in the past few days has brought some relief, but it is apparent that if English strike conditions continue, American consumers will be put to considerable inconvenience to get supplies, as German makers have informed makers they have little prompt material to offer. Small sales of ferro-manganese for early delivery have been made at $46.00, seaboard, and one carload is reported at a considerably higher price. Present forward inquiry is small. A St. Louis buyer is inquiring for 350 tons of 50 per cent ferro-silicon and 200 tons of ferro-manganese for last half. We quote 80 per cent standard ferro-manganese at $41.00, seaboard, and 50 per cent ferro-silicon at $68.00 to $70.00, Pittsburgh.

Cast Iron Pipe.—A good movement of business with eastern pipe shops continues. Private buyers continue to put out their inquiries quite freely. No additional lettings of public importance are announced this week. Despite the better conditions, there are still some low sellers and prices harden slowly. We quote 6-inch pipe at from $22.00 to $23.00, f. o. b. New York, in carload lots.

Finished Material.—Steel makers are apparently making more earnest efforts to get finished prices upon a higher level. Other companies, including some of the smaller eastern independent mills, are following the lead of the larger interests and are placing their asking schedules on the basis of 1.20c, Pittsburgh, for shapes and plates, or 1.36c, New York, and steel bars at 1.15c, Pittsburgh, or 1.31c, New York. These prices however, while they have been obtained on small sales can scarcely be regarded as the market for tonnages of

any size on which the 1.15c quotation is being made and on particularly attractive lots, this level is being shaded. Structural shape prices have shown probably the most softness and are receiving the careful attention of makers.

The tone of the market remains very satisfactory and the tendency is distinctly in the direction of higher levels which suggests the firming up of prices at no very distant date, if present conditions prevail. The structural market in the metropolis is bringing forth only a moderate tonnage at the moment, but indications point to much work in the drawing stage to come out a little later. Fabricating prices are still a source of much dissatisfaction among manufacturers.

No award has yet been announced on the Long Island railroad bridge requirements, upon which bids have been entered and the tonnage still remains indefinite. Decision is still withheld between steel or concrete construction for the Tuckhannock cutoff of the Delaware, Lackawanna & Western railroad, which will require a large tonnage if the former plans prevail.

In the case of several New York contracts, for which original verbal awards have been reconsidered, announcement is now made that Mulcahy & Gibson will fabricate 2,500 tons for the Bellevue hospital and the A. E. Norton Co. has 1,200 tons for the loft building at Fourteenth street and Seventh avenue. The Albany high school, 1,000 tons, has gone to the American Bridge Co. The Phoenix Bridge Works has 400 tons for the Poli theater, Bridgeport, Ct., and the Eastern Steel Co., 200 tons for bridges for the Atlantic Coast Electric Railway. The American Car & Foundry Co. has placed 1,500 tons of shapes with an eastern mill for 500 cars to be built for the Western Maryland Railroad. General bids have been entered for the Boston City Hall, to require 2,000 tons. T. A. Clark has taken the general contract for a theater in Brooklyn to require 400 to 500 tons. Plans are out for a ferry house at Thirty-ninth street, Brooklyn, for which the tonnage is not stated. No action has yet been taken on the Phillips-Jones factory, up town, 1,000 tons. Bids have not yet been entered upon the new Stern store, 6,000 to 8,000 tons, which is one of the most attractive contracts now pending in the metropolis.

We quote delivered at New York tidewater as follows:

Plain structural shapes 1.26c to 1.36c; tank plates, 1.26c to 1.36c; steel bars, 1.26c to 1.31c; common iron bars, 1.25c to 1.30c; plates and shapes from store, 1.70c to 1.80c; extras as shown under Pittsburgh report.

Old Material. — The old material market in the metropolitan district has become more spotted. In general there is more interest in the market but this is not equally distributed among consumers. Eastern rolling mills have been buying scrap in a larger way and have been offering around $14.75 delivered for No. 1 railroad wrought. There is some inquiry and buying for car wheels. Little change is noted in heavy steel except that brokers covering upon shorts have been offering advances of about 25 cents. The eastern mills will usually not pay over $12 delivered. Cast scrap seems a little easier, Newark and Jersey City foundries offering about $12.25 delivered for heavy cast and $13 to $13.25 delivered for No. 1 machinery. We quote gross tons New York dealers will pay at New York tidewater as follows:

Old car wheels	$11.00 to 11.50
Old iron axles	16.00 to 16.50
Old steel shafting	13.75 to 14.25
No. 1 heavy melt'g steel	9.70 to 10.00
No. 1 R. R. wrought	12.50 to 12.75
Wrought pipe	9.25 to 9.50
Cast borings	6.00 to 6.50
Mach. shop turnings	6.75 to 7.00
Heavy cast	10.50 to 10.75
No. 1 machinery cast	11.00 to 11.25
R. R. malleable	9.25 to 9.75
Stove plate	8.00 to 8.50
Grate bars	6.50 to 6.75

Freight rates on scrap per ton to Steelton, Pa., Columbia, Pa., Pottsville, Pa., and Harrisburg, Pa., are $1.50 from Jersey City and $2.00 from New York; to Coatesville, Pa., Ivy Rock, Pa., Phoenixville, Pa., and Reading, Pa., $1.50 from Jersey City and $1.80 from New York; to Bethlehem, Pa., $1.10 from Jersey City and $1.60 from New York; to Roebling, N. J., $1.00 from Jersey City and $1.50 from New York; to Milton, Pa., $1.60 from Jersey City, and $2.00 from New York.

ST. LOUIS

Fair Inquiry for Pig Iron—Prices Firm

Office of THE IRON TRADE REVIEW,
St. Louis, March 26.

Pig Iron.—Inquiries appeared in the mails this morning for 1,000 tons of No. 2 and 3 Northern foundry iron, 300 tons of ferro-silicon and 200 tons of ferro-manganese, beside scattering lots that would foot up a fair tonnage. Prices are fairly firm at $10.25 to $10.50 for No. 2, Birmingham basis, and the outlook for better conditions is believed to be good. Our prices delivered, to which the Birmingham freight of $3.75 has been added, follow:

Southern	No. 1	$14.50 to 14.75
Southern	No. 2	14.00 to 14.25
Southern	No. 3	13.50 to 13.75
Southern	No. 4	13.25 to 13.50

Coke.—The demand for coke remains fairly good, but shipments on contracts continue difficult because of a car shortage. Prices are firm, as follows:

We quote 72-hour Connellsville foundry grades, $2.50 to $2.65 for second quarter of 1912; 72-hour foundry, $2.25 to $2.50 on tracks and $2.75 to $2.85 for immediate delivery; 48-hour Connellsville furnace, $2 to $2.25; best 72-hour Virginia foundry, $2.50 to $2.75; 48-hour Virginia furnace, $2 to $2.25. The freight to East St. Louis and St. Louis is $2.80, and $2.70 from the Virginia fields when shipment is destined beyond St. Louis.

Finished Material.—The tailor who held up the new Monward building several weeks ago, refusing to surrender his lease in the building now occupying the site of the proposed new one, has been paid a bonus of $25,000, and promoters of the new enterprise assert the old building will be razed at once and the new one, an 18-story steel frame office structure, rushed to completion. It is generally understood that the contract will go to James Stewart & Co. The tailor has agreed to surrender his lease by July 1. The lot fronts 140 feet on Olive street and 115 feet on Broadway. Several new hotels are talked of. It is now generally believed that the plant of the Busch-Sulzer Bros. Diesel Engine Co. will not move from St. Louis. The company is capitalized at $2,100,000, and proposes to erect a factory that will have an annual payroll of $500,000.

Old Material. — Trading in scrap iron has improved somewhat, although no large contracts are reported this morning. Prices remain firm, as follows:

Gross Tons

Old car wheels	**$13.00 to 13.50**
Old iron rails	14.50 to 15.00
Re-rolling rails (5 ft. and over)	12.50 to 13.00
Old steel rails (3 ft. and under)	11.75 to 12.75
Light section relayers (45 lb. and under) subject to inspec.	21.00 to 22.00
Re-laying rails, subject to inspec.	22.00 to 22.50
Frogs, switches and guards	10.00 to 10.50
Heavy melting steel	11.00 to 11.50
Shoveling steel	10.25 to 10.75

Net Tons

No. 1 railroad wrought	$11.00 to 11.50
No. 2 railroad wrought	10.00 to 10.50
Arch bars and transoms	13.50 to 14.00
Knuckles, couplers and springs	10.00 to 10.50
Shafting	13.50 to 14.00
Iron car axles	18.00 to 18.50
Steel car axles	15.50 to 16.00
Locomotive tires	11.00 to 11.50
No. 1 country wrought	8.75 to 9.25
Pipe and flues	8.00 to 8.50
Tank iron and cut boilers	7.00 to 7.50
No. 1 cut busheling	8.75 to 9.25
No. 2 cut busheling	6.25 to 6.75
Cast and mixed borings	5.75 to 6.25
Machine shop turnings	6.50 to 6.75
Railroad malleable	10.00 to 10.50
Agricultural, malleable	9.00 to 9.50
Stove plates	9.00 to 9.50
Angle splice bars (iron)	11.00 to 11.50
Angle splice bars (steel)	9.00 to 9.50

BRITISH MARKET

British Iron Trade Utterly Prostrated

Birmingham, Eng., March 26. (By cable.)—The coal strike deadlock continues and not a ton of either pig or finished iron is being produced. It is generally conceded that the spring trade is ruined. Cleveland pig iron is now at the highest price in two years. All pig iron stocks except in the Cleveland district have been exhausted. Manufacturing business is at a complete standstill and orders have been transferred from British mills to continental makers. Heavy sales of finished material have been stopped by suspension of operation by the railways. Many thousands of workmen have been added to the idle list by the cessation of work in the iron plants today, thus increasing the distress and general pessimism.

SEATTLE

Pig Iron Finding Much Readier Sale

Office of THE IRON TRADE REVIEW,
Seattle, March 22.

The speedy settlement of the affairs of the Western Steel Corporation and the resumption of operation of the works at Irondale, Wash., is foreshadowed in the statement issued by representatives of the Metropolitan Trust Co., of New York. The Trust company has bought in the control of the corporation for $720,000, carrying with it the assurance that labor claims, totaling $40,000, would be paid. Although some legal questions yet remain to be settled, the representatives of the company announce that the plant will be in operation within 60 days of the entry of the decree of sale. Plans for the rehabilitation of the plant are already under way.

The past month, according to the reports of the local custom houses, has been one of the heaviest in the history of the Puget Sound country in the exports of manufactured iron and steel. During February iron and steel manufactured products to the value of $893,774 have been shipped through this port. The present month bids fair to exceed this. The greater part of exportations has been to the orient.

Pig Iron.—Although slightly lower than the first two months of the year, prices are strong over last fortnight's decreases and with increasing demand. Both domestic and foreign irons are finding a ready market with the domestic brands having the call. Some of the higher grade English and Scotch irons are meeting with ready sale but at slightly reduced prices. Alabama and Tennessee irons are more in evidence on the market than at any time in the past year. We quote:

	Prompt.	Second Quarter, 1912.
No. 1 Glengarnock	$23.00 to 24.00	24.00
No. 1 Eglinton	22.50 to 23.00	23.00
No. 1 English Jarrow	21.50 to 22.50	22.50
No. 1 Cleveland	23.00 to 23.50	23.50
English Doncaster	21.00 to 22.50	22.50

Coke.—With the increased demand for iron, the coke market has responded in sympathy. Prices, however, maintain a level which has not been affected to any material degree in some time. A trifle more imported coke is in evidence, but the demand for the higher grade is not sufficiently heavy to warrant a raise in price.

Old Material.—Old material, especially the higher grades, is in greater demand. Slight increases averaging 50 cents the gross ton, are noted in the better grades. Foundries are taking liberally and the call for additional material with the opening of spring work is generally noted. We quote:

Iron rails	$14.00 to 16.00
Rerolling steel	14.00 to 14.50
Old axles	19.50 to 20.00
Car wheels	12.25 to 13.00
Smelting, scrap	10.00 to 12.00

BIRMINGHAM

Higher Price for First Half Pig Iron Established

Office of THE IRON TRADE REVIEW,
Birmingham, Ala., March 26.

Pig Iron.—The production of foundry iron has just been reduced by the blowing out of one furnace, and the suspension of operations temporarily at another plant. The first referred to will be out of commission for an indefinite period, and thereby offset the increase made in this month. In the past week, a very liberal tonnage was entered for prompt shipment, and calls against contracts were unusually heavy. The prices received were in line with a $10.50 per ton, Birmingham, basis, without commitments for delivery after July 1. A wide range of territory was covered by the transactions of the week, and the absence of sales to the leading consuming interests was noted. At this time, a large pipe manufacturing concern is negotiating for a round tonnage of Nos. 2, 3 and 4 foundry, for shipment through the third quarter. Aside from this, the tonnage pending consists of less than 1,000-ton lots, which are for shipment in the second quarter. It is understood that some tonnage for export is still to be had at a slight concession in price. For forward deliveries, there is some tendency to advance prices to a basis of $11, Birmingham. No figures are being submitted for the last quarter, and in practically all cases, quotations on a $10.50 basis insist on shipment within the remainder of the first half. The local melt gradually increases,

and reports in other directions do not indicate the accumulation of stocks on founders' yards. It is understood that operations will be commenced at a local pipe plant within a few weeks, that will add materially to the consumption. Summarizing, the $10.50, Birmingham, basis has been firmly established for such tonnage as is required for delivery in the remainder of the first half; the prospect of heavy buying, to meet the requirements in the third quarter is such as to warrant indifference on the part of producers as to such tonnage, while it is believed that by the time last quarter requirements are urgent, the stock accumulations and the daily output will be so closely adjusted to the requirement of order books that an advance over the present schedule of prices can be made effective. For the several grades offered, the following schedule of prices is considered firm where deliveries can be made prior to July 1:

No. 1 foundry	$10.75 to 11.25
No. 2 foundry	10.25 to 10.75
No. 3 foundry	9.75 to 10.25
No. 4 foundry	9.25 to 9.75
Gray forge	9.50 to 9.75
Mottled	9.25 to 9.50
Standard basic	10.25 to 10.75
Off basic	10.00 to 10.50
Standard charcoal	22.50 to 23.00

These prices are per gross ton f. o. b. cars at Birmingham district furnaces.

METAL MARKETS

St. Louis

March 25.

Lead and Zinc.—Choice grades of zinc blende brought as much as $55 a ton in the Missouri-Kansas-Oklahoma district last week, with the base price for 60 per cent qualities ranging from $52 to $48 a ton, as compared with $55.50, the base figure of two weeks ago.

The demand for blende was not strong, and the output was increased from 4,500 to 5,500 tons within the last two weeks. This was largely due to the high prices that had prevailed.

Calamine was in strong demand, but owing to the curtailment of production on account of inclement weather, very little ore was obtainable.

Lead ore was weak at $50 to $54 a ton.

Chicago

March 25.

New Metals.—The principal feature of interest during the week, of course, was the sensational rise in copper. A good many consumers of this metal are scampering to cover. Lake copper is quoted 15½c, Chicago, and casting copper 15c, this being an advance of about 1c a pound in the last three weeks. Spelter is no higher but continues firm. Lead has improved somewhat and is now quoted 4.20c, Chicago.

We quote, dealers' selling prices, f. o. b. Chicago, as follows:

Lake copper, carload lots, 15½c; casting, 15c; smaller lots, ¼c to ¾c higher. Spelter, car lots, 6.55c; lead, desilverized, 4.20c in 50-ton lots; corroding, 25c per 100 pounds higher: sheet zinc, 8.65c list, f. o. b. La Salle, in car lots of 600-pound casks; pig tin, 43c. Cookson's antimony, 8½c; other grades, 7½c to 8c.

Old Metals.—The old metal market is reflecting to a large extent conditions which exist in the new metal field and prices are firm on copper, brass and zinc. Buying is still on a restricted scale.

We quote, dealers' selling prices, f. o. b. Chicago, as follows:

Copper wire, crucible shapes, 13½c; copper bottoms, 12¼c; heavy cut crucible copper, 13½c; heavy red brass, 11¾c; heavy yellow brass, 9½c; No. 1 red brass borings, 9½c; No. 1 yellow brass borings, 8¼c; brass clippings, 9c; lead pipe, 3½c; zinc scrap, 4¾c; scrap aluminum, 12½c; tea lead, 3¾c; No. 1 pewter, 28c; block tin pipe, 39c; tin foil, 35c; linotype dross, 3¼c; electrotype dross, 3c; stereotype plates, 4½c; stereotype dross, 3¼c; prime slab zinc dross, $90 a ton.

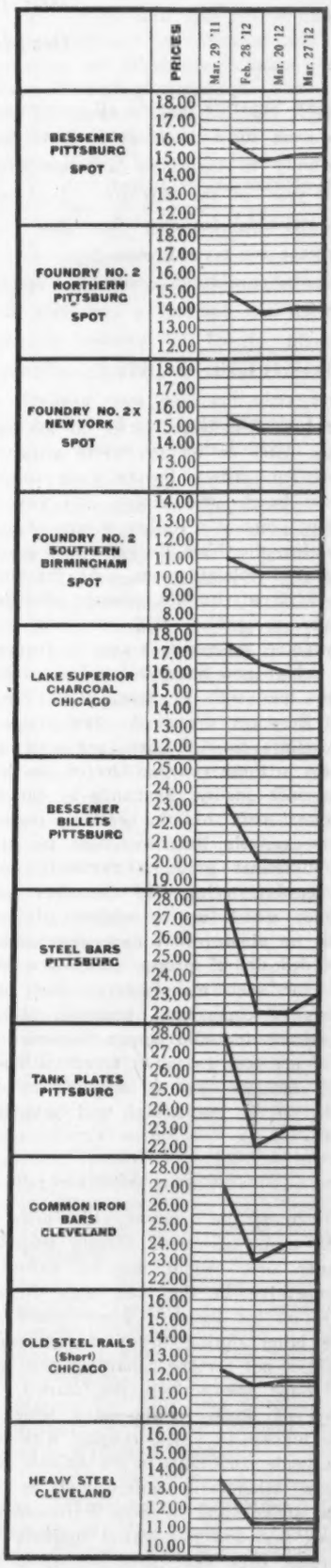
New York

March 26.

Tin.—The London market has displayed remarkable strength during the past week. Since the opening Monday, the strength has been most pronounced. Prices today at the close of business are over £4 above the closing quotations of March 19, abroad. Spot is £196 and three months is £191 5s. The domestic market is up about 1c per pound. While there has been a fair demand for the metal from domestic consumers, it is hardly likely that English consumers have been active buyers, and there is a strong suspicion among local interests that the recent bullish demonstrations are closely related to the Banca auction which will be held at Rotterdam, Holland, Wednesday.

Lead.—The American Smelting & Refining Co. has made two advances in the price since March 19, aggregating $4 per ton. Its shipment is now 4.20c in New York. Independents, however, continue to get business on a considerably higher basis, at 4.37½c in New York.

PRICE CHART



Greater Tonnage of Lake Ores Will Go East

New Low Prices and Conditions Surrounding Foreign Ore Market Give Superior Shippers Unusual Opportunity

Lake Superior ores to all present appearances have the most favorable opportunity to figure on a larger scale this year in the mixtures of eastern Pennsylvania furnaces than has been the case for several years past.

Contemporaneous conditions in the foreign and domestic ore markets have brought about the present situation. Lake ores under the recently announced price reduction, are now available at the lowest delivered price in the east since 1904 or at the most attractive level for eastern buyers since foreign mines have come actively into view in recent years as a leading source of supply for the blast furnaces within the Atlantic seaboard zone. At the price of $2.85 at Buffalo, Mesabi non-Bessemer ore of a 51½ per cent iron guarantee, represents a cost to furnaces in Lehigh and Schuylkill valleys of 8.35 cents per unit of iron. Old Range non-Bessemer ore at the new prices is equivalent to 8.74 cents per unit laid down in these valleys. Ore of the non-Bessemer quality commands by far the greater part of the eastern market. Comparatively little merchant pig iron of Bessemer grade is regularly made by eastern sellers and the steel companies which are producers of such iron for their own consumption control ore deposits of proper phosphorus limits for such manufacture. For purposes of comparison, however, Mesabi Bessemer and Old Range Bessemer on a 55 per cent guarantee represent 9 and 9.45 cents per unit of iron, respectively, delivered in the Lehigh and Schuylkill valleys.

Foreign Ores Shut Out

Even at the relatively low price of 8.35 cents per unit, Mesabi non-Bessemer ores would not be favorably competitive in the east with foreign ores on the basis of prices asked for the latter during the past few years, were it not for the conditions that now surround the foreign ore market. A level of ocean freight rates, which is the highest in years, coupled with active trade conditions in the British Isles (now temporarily interrupted by the coal strike) and in those European nations that are the logical markets for foreign ores have shut out from the east this year on an important scale, much of the ore from trans-Atlantic sources. Sales of Spanish ore, of which the imports were 125,000 tons in 1908, 290,000 tons in 1909, 440,000 tons in 1910 and 200,000 tons in 1911, and made at prices ranging from 7 to 7½ cents per unit, Philadelphia, for non-Bessemer grades, have been confined this year to a few scattered carloads. There have been no sales of the richer African and Grecian ores which have been used in varying quantities in the past. These ores, however, rank considerably above lake non-Bessemer ores in analysis. Little, if any, additional Swedish ore over that which is already under engagement by contracts antedating this year can be offered in this country under present conditions. These Swedish magnetites with an iron content of 65 per cent and at a price of 8 to 8½ cents per unit, Philadelphia, have offered an attractive purchase to eastern furnacemen.

Sales to eastern furnaces, of ore from the North American continent outside of the United States so far this year have aggregated about the average total of the past several years. These ores have, in the main, been sold at prices considerably below the level at which lake non-Bessemer ore is now offered, but the remaining tonnage of such material still open to the east this season is not large. There has been engaged for delivery this season 170,000 tons of Wabana, Newfoundland, ore, a 54 per cent non-Bessemer material which was sold at 7 cents per unit, Philadelphia. Some deferments of this ore from last year's contracts promise to bring the season's movement up to about a normal stage. There has also been sold and partially delivered for first half, 90,000 tons of Cuban ore from the Ponupo Manganese Co. properties, which is a Bessemer material that was sold at 7 cents per unit, Philadelphia. These sales of North American ores, together with the running contracts for trans-Atlantic ores bring the total of foreign ore engaged for this season by eastern furnaces to about 650,000 tons at the present time. This includes 350,000 tons of Swedish ore of which 250,000 tons will go to the Bethlehem Steel Co., as its second annual portion under its nine-year contract, and a large tonnage to the Reading Iron Co., a regular consumer. There are also included some scattered sales of Spanish, Canadian, Venezuelan and other ores.

In 1911 the total foreign ore movement to eastern furnaces was approximately 1,800,000 tons, of which 1,150,000 tons was Cuban ore, practically all of which was mined by the companies that consumed it. This left about 650,000 tons of ore, which was drawn from other countries. The foreign ore, excluding the small tonnage of Cuban ore, already sold for delivery in the east this year is about 550,000 tons, as stated. This shows to about what an extent on the basis of a movement this year equivalent to 1911 that Lake Superior mines will likely be called upon to substitute their ores for the foreign material shut out. Such figures are only suggestive, however, for there will probably be some readjustment of mixtures to include more lake ore than in the past.

Port Henry Ores Lower

Lake ores at a reduced price in the east will probably have little, if any, effect upon the markets for ores from the Port Henry or Lake Champlain districts or from the local deposits of New Jersey and New York. In fact, Port Henry interests are already well sold up on their expected output for 1912. These sales have been made this year at materially reduced prices, which are equivalent on the average to 7.25 cents per unit for 60 per cent ore to 7.9 cents per unit for 65 per cent ore, delivered in the Lehigh and Schuylkill valleys. Ores from the Lake Champlain district this year are being quoted at a Port Henry basis instead of at Mineville. as heretofore, but this plan makes no difference in the delivered price to consumers and is being followed because the former location offers superior dockage and shipping facilities.

The local New Jersey and New York state ores, which are of limited supply, are selling this year at from 7¼ to 7½ cents per unit, delivered in the east, for 56 to 58 per cent material and will undoubtedly hold their market against the competition of lake ores.

Already several sales of lake ores have been made to eastern consumers for this year's delivery. One regular consumer of lake Bessemer for acid open-hearth furnace practice, has

closed for its requirements, and another steel company has taken a block of Mesabi non-Bessemer ore of a considerably larger tonnage than in the past for its blast furnace mixture. Other negotiations have been under way and some of these have probably been closed.

In the event of increased furnace operations in the east over the year, lake ores will undoubtedly reap a large benefit from this condition. On the basis of present curtailed operations, however, the unfilled requirements of the east now open to lake ores at current prices, though larger than for some years, will probably not aggregate a pretentious tonnage.

TAKES OVER PLANT

Of Western Steel Corporation, Covering Loan Once Made.

All of the assets of the Western Steel Corporation, with works near Seattle, Wash., have been bought by the Metropolitan Trust Co., of New York. The price paid was $720,000, the amount of the company's claim for money loaned to the corporation. The sale was made by the referee in bankruptcy. The assets were a steel plant at Irondale, Wash., and lands in that state and British Columbia, said to contain timber, iron and coal. The corporation was capitalized at $20,000,000 and promoters said it had assets worth $37,500,000, promising holders of common stock dividends of 20 per cent a year.

Plan to Rebuild Plant

The Missouri Malleable Iron Co., East St. Louis, Ill., advises that it has made plans to replace its buildings which were destroyed by fire on the morning of Feb. 28. The buildings will all be one-story, from 22 to 23 feet high, with flat roof supported on steel trusses and will be absolutely fireproof. The total area covered by the new buildings will amount to about 35,000 square feet, an increase of about 25 per cent over the destroyed buildings. The company has, through a rearrangement and crowding, succeeded in resuming operations which are practically equal to the same capacity as that obtained previous to the fire, or about 80 per cent.

The Lower Lake Dock Co., Cleveland, has been incorporated with a capital stock of $25,000. The incorporators are W. P. Schauffle, R. E. McMahon, R. B. Maltby, L. J. Binder and E. F. Grant. The company was organized for the purpose of operating docks for handling ore, coal and other merchandise.

CONVENTION FEATURES

National Metal Trades Association Meets in New York, April 11.

The program for the fourteenth annual convention of the National Metal Trades Association, which has just been published, contains several unusual features. The convention will be held Thursday, April 11, at the Hotel Astor, New York City, the formal sessions will be two, in the morning and in the afternoon. The convention banquet will be held Thursday evening, at 7 o'clock, at the Hotel Astor. In case all the business is not concluded at the Thursday afternoon session, it is possible that another session will be held Friday morning. A feature of the afternoon will be a tea, given to the ladies accompanying members of the association to the convention.

After the formal opening of the convention Thursday morning, the announcement of convention committees, reports of officers, etc., the report of the standing committee on systematic compensation for industrial accidents will be read by William Butterworth, chairman; on apprenticeship, E. P. Bullard Jr., chairman; on industrial education, F. A. Geier, chairman; and J. H. Cone will read the paper on "The German Method of Technical Education."

On Thursday afternoon, W. H. Doolittle, National Metal Trades Association's safety inspector, will speak on prevention of industrial accidents, illustrated with stereopticon views and followed by general discussion. Miles M. Dawson will discuss the timely topic, "What Has Been Done Up to the Present Time and Is Now Doing in Employers' Liability and Workmen's Compensation?" The discussion of "What is the Matter with Business?" will be inaugurated by F. F. Feeley, of Boston. The resolution committee will report, as will also the nominating committee, and election and installation of officers will take place, all on Thursday afternoon.

At the convention banquet Thursday evening, the list of speakers will include Hon. Charles Nagel, secretary of the department of commerce and labor; former Congressman Charles E. Littlefield; W. Morgan Shuster, former treasurer of Persia, and John Barrett, director general of the pan-American union.

Valuable Map of Pittsburgh

In the form of an insert to this issue of THE IRON TRADE REVIEW *has been reproduced a map of the Pittsburgh district, compiled by the National Tube Co., which shows the railroad terminals and the locations of the iron and steel works of that great manufacturing center having track connections. This map was recently completed and shows the locations of the various plants as of Jan. 1, 1912. A total of 232 plants is indicated and the map also shows the location of the new works of the Jones & Laughlin Steel Co. at Aliquippa, and other plants within a radius of approximately 30 miles from the confluence of the Allegheny and Monongahela rivers.*

PUZZLING QUESTION

May be Solved by United States Commerce Commission.

The ownership by the United States Steel Corporation of the Bessemer & Lake Erie Railroad Co. presents a tangle that may soon be unraveled by the Interstate Commerce Commission. The commission has determined that in the future railroads may own docks and may lease them to agents who are not consumers of ore.

At the hearing in Cleveland, Saturday, of the ore dock cases, S. H. Smith, representing the commission, expressed the belief that the commission would take up the Corporation's ownership of the railroad in the light of the determination that consumers of ore cannot lease docks from railroads. The matter, he said, would probably be called up at the hearing to be held within a few weeks on the request made by certain interests for a lower freight rate to the Shenango and Mahoning valleys from the lower lake ports.

Until the actual determination of the commission is made known, it is impossible to determine whether the Corporation's ownership of the railroad, and through it the docks, would conflict with the expected ruling and if a conflict existed, to what lengths the commission could go in solving the problem.

The Ella Furnace Co., Cleveland, has been incorporated with a capital stock of $200,000. The company will operate the Ella furnace at West Middlesex, Pa. The incorporation is a formality in the management of a Pickands-Mather property.

The Wheeling Corrugating Co., Wheeling, W. Va., is about to erect a two-story, 126 x 206-foot building in Chicago.

CAR BUYING OUTLOOK

Is More Promising—Wabash Orders Placed.

New York, March 27. (By wire.)—The Wabash has placed 700 box cars and 500 stock cars with the American Car & Foundry Co., and 500 box cars with Haskel & Barker. With 200 hoppers recently given the Standard Steel Car Co., this makes 1,900 placed to date. It is expected to still make a purchase of automobile cars. The Atlantic Coast Line inquires for 1,900 box cars and 100 flat cars. The outlook for a revival of car buying appears more promising, as a number of matters are now shaping themselves quietly though they have not yet reached the market.

Ohio Works Rail Mill to Resume April 7

Pittsburgh, March 27. (By wire.)—The Carnegie Steel Co. has ordered the rail mill of the Ohio works, at Youngstown, to run on rails after April 7. The plant has been running on billets or has been idle for about six months. Its new activity places the entire rail capacity of this company in service. The company is now on a higher productive capacity of standard section rails than for some years.

Annual Ore Analyses Books

Pickands, Mather & Co., Cleveland, have issued their annual pamphlet showing the analyses of the Lake Superior iron ores handled by them last year. The booklet contains analyses of a large number of Old Range and Mesabi Bessemer and non-Bessemer ores as well as some manganiferous and silicious ores. Scranton ores Nos. 1 and 2, Mesabi non-Bessemer ores, are two new grades of ore listed. They are from a new mine opened several years ago and shipments from which will be made this year for the first time.

A handsome brochure showing ore analyses has just been issued by Oglebay, Norton & Co., Cleveland. It shows a number of new ores now handled by them, including the Asteroid, Holland, Kirtland and Moose Mountain briquettes. The latter ore is made by the Grondal process, the ore being crushed, then washed and separated and pressed into briquettes. The process is much in use in Europe, but its use at the Moose Mountain mine is the first application in the Lake Superior district. A map of the recently opened Cuyuna range was also prepared for distribution.

M. A. Hanna & Co., Cleveland, have issued their annual analyses book. In addition to the large number of ores that have been handled by them in former years, they give the analyses this year of two new high grade ores, the Ella and Norman. They are from newly opened ore bodies of the Palms and Anvil mines on the Gogebic range.

The Shenango Furnace Co., Pittsburgh, has also issued its annual analyses book. Analyses are shown for the various Bessemer and non-Bessemer ores of the Mesabi range and the silicious ores of the Menominee range, handled by the company. Colored views are shown of the Shenango mine, three of the steamers owned by the Shenango Steamship & Transportation Co. and the Shenango Steamship Co., as well as scenes at the company's furnaces.

BOND ISSUE

By the United States Steel Corporation—Judge Gary's Statement.

New York, March 27. (By wire.)—The New York *News Bureau* today says:

The United States Steel Corporation has sold the issue of $30,500,000 of bonds to J. P. Morgan & Co. The sale was authorized by the vote of the directors not including any of the firm mentioned. The sale of this issue was on the basis of 5.1 per cent interest and included $15,000,000 secured by the Indiana steel plant, at Gary, $10,000.000 secured by the Lorain Steel Co., at Lorain, O., and $5,500,000 5½ per cent debentures of the Illinois Steel Co. These are a part of an issue heretofore authorized.

Chairman E. H. Gary, in a statement authorized by the directors, says:

"There must be expended during the year $20,000,000 for extensions of properties generally, all of which has been authorized before, and about $17,000,000 must be added to working capital. This is needed in consequence of the increased business of the various companies. Part of this will be used in the ore department. It has been considered advisable to secure the sum named by the sale of bonds in order to keep the amount of cash in hand up to the sum shown at the beginning of the calendar year. In view of the fact that very large sums have heretofore been appropriated from net earnings for capital expenditures, it has been decided to finance some of the capital expenditures as above stated."

INCREASED ORDER

From Rock Island—Accident at Harvester Plant.

Chicago, March 27. (By wire.)—The Rock Island has increased its rail order to 26,550 tons, divided 10,600 tons of 90-pound, 13,750 tons of 100-pound and 200 tons of 80-pound, to the Illinois Steel Co.; also 1,000 tons of 100-pound to the Lackawanna Steel Co.; 500 to the Pennsylvania Steel Co. and 500 to the Cambria Steel Co., same weights.

A gas explosion in the cupola and a fire at the plant of the McCormick Harvester Co., Chicago, yesterday, destroyed a building, killing two men and causing damage of $100.000. Ten men were injured. The explosion was probably caused by snow or water mixed with cupola charges.

Corporation Activity

New York, March 27. (By wire.)—The American Steel & Wire Co. has purchased 3,600 tons of low phosphorus iron for last half for its Worcester plant from a New York state maker.

The United States Steel Corporation is now running at better than 90 per cent of maximum ingot capacity, which, in view of recent works additions, signifies the highest rate of output in its history.

To Make Tin Plate

Pittsburgh, March 26.—A report from Wheeling states that the buildings and property of the old West Virginia Bridge & Construction Co., near that city, have been purchased by eastern men, who are preparing to organize a new company to manufacture sheets and tin plates. Those behind the operation are not made public, but it is announced that full details will be made known in a short time.

For Plant Extension

New York, March 27. (By wire.)—The American Bridge Co. has taken 5,000 tons for extensions to the plant of the J. I. Case Threshing Machine Co., Racine, Wis.

Alternate Stack Completed.—An alternate stack under construction at the blast furnace plant of the Alan Wood Iron & Steel Co., Swedeland, Pa., has been completed and is now being connected up, in readiness for operation when trade conditions warrant its use.

A Self-Contained Steel Plant in Southern Ohio

Additions and Extensions to the Portsmouth Steel Co.'s Works, With a Description of the General Layout and Arrangement of Departments

To finish its excess steel output, which has heretofore been sold in the form of billets, slabs, etc., the Portsmouth Steel Co., Portsmouth, O., has added five sheet mills, three stands of cold rolls, three jobbing mills, a large galvanizing plant and a corrugating department. Work on the erection of the jobbing and sheet mill plant was begun early in 1911 and the equipment throughout is modern in every detail. The building is of steel construction, 275 x 490 feet, and all of the various departments of this plant are under one roof. These include the heating and annealing furnaces, hot and cold mills, pickling and galvanizing works, corrugating plant, warehouse and shipping department.

Layout of the Plant

As shown on the accompanying insert, the plant, which covers a site of approximately 100 acres, parallels the Ohio river with the open-hearth furnaces at one end. The material is carried forward through the various finishing operations in practically a straight line, thereby greatly reducing the cost of handling. The plant now consists of seven 60-ton basic open-hearth furnaces, a 35-inch blooming mill, an 84-inch three-high plate mill, an 18-inch three-high bar mill, one 48-inch, one 60-inch and one 66-inch jobbing mill, five sheet mills, three stands of cold rolls and the pickling, galvanizing and corrugating works. The product consists of plates, blue annealed, one pass cold-rolled black and galvanized sheets and galvanized roofing, "Portsmouth" iron, tie plates, billets and slabs. The plant is entirely self-contained, as all of the steel finished is melted in the company's own open-hearth furnaces.

Hanging Rock District

Portsmouth is located in the Hanging Rock district of Ohio, where the first iron smelting furnaces west of Pittsburgh were built. These furnaces smelted the native ores which were in abundance and used charcoal for fuel. Owing to the depletion of the forest, however, many of the earlier stacks went out of commission, while others were rebuilt, and while charcoal is still used to some extent, many of the blast furnaces are operating with coke for fuel and in addition to the native ores, are using varying percentages of ores from the Lake Superior region.

The Portsmouth Steel Co. is the successor to the business established by the Burgess Steel & Iron Works in 1811. The original plant was located in the west end of the city at the confluence of the Scioto and Ohio rivers. In 1898 the plant was removed to the eastern section of Portsmouth where better railroad and river shipping facilities were provided. The product at that time consisted of steel bars, plates, structural shapes and special steel plates for safes and vaults. The property was acquired by the present owners in 1901 and it then consisted of two acid and one basic open-hearth furnace, a 22-inch blooming mill, 28 x 60-inch jobbing mill and a 21-inch bar mill. All of this equipment was early discarded and the plant was rebuilt and enlarged from time to time until its output at present approximates 200,000 tons annually.

Open-Hearth Plant

Steel is produced in seven basic open-hearth furnaces of 60 tons capacity each. These furnaces are served by two electrically-operated charging machines, installed by the Wellman-Seaver-Morgan Co., Cleveland. The open-hearth building is 100 x 528 feet, 6 inches, and the casting bay is served by two 100-ton cranes equipped with 25-ton auxiliaries which command the entire length of the building. In addition there is a 10-ton crane, as well as jib cranes at each of the furnaces for handling the spouts, etc. The ingots, after being cast, are stripped by a 125-ton stripping crane equipped with a 10-ton auxiliary, installed by the

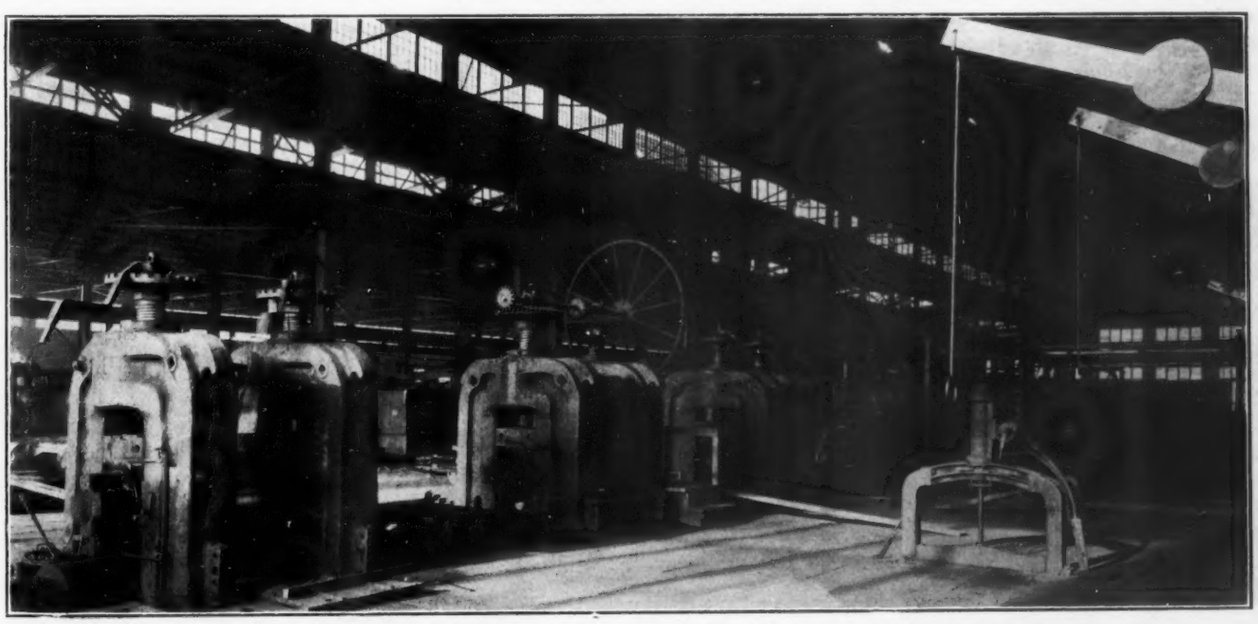


FIG. 1—A VIEW IN THE POWER HOUSE, SHOWING TWO OF THE TURBO-GENERATORS

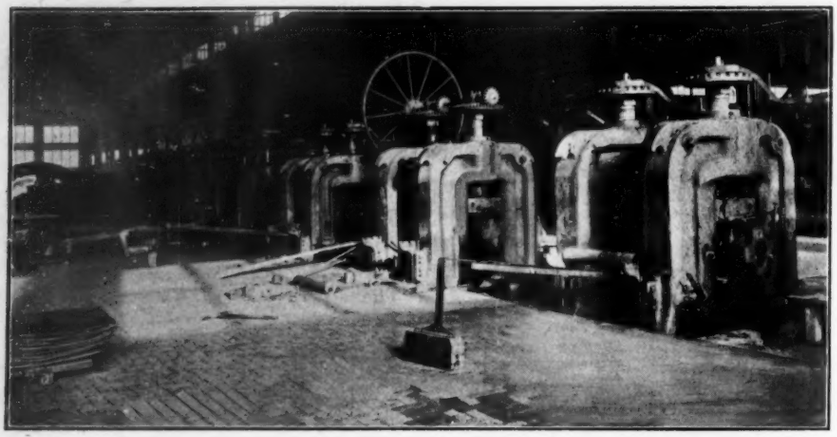


FIG. 2—CATCHER'S SIDE OF 30-INCH SHEET MILLS

Morgan Engineering Co., Alliance, O. The two large ladle cranes as well as the smaller 10-ton crane in this department were furnished by the Alliance Machine Co., Alliance, O. The furnaces use natural gas for fuel, but also are equipped for burning oil or producer gas. Owing to the growing scarcity of the natural gas supply in this district a change to fuel oil is being contemplated. For emergency purposes, a producer plant for the open-hearth department has been installed, which consists of 18 gas producers. A view of the charging platform of the open-hearth plant, showing several of the open-hearth furnaces, as well as one of the charging machines, is illustrated in Fig. 8. The ingots cast vary in size from 18 x 22 inches to 20 x 30 inches. They are all stamped with the heat number so as to identify the material throughout the different processes of its manufacture into the finished product.

The soaking pit building adjoins the open-hearth furnace department and is 66 x 200 feet. It is provided with three 4-hole soaking pits, which are natural gas fired and are provided with hydraulically-operated covers, as illustrated in Fig. 10. The soaking pits are each 7 x 9 feet in size and also are arranged for the use of producer gas as fuel.

From the soaking pits the ingots are delivered to the entering table of the blooming mill, which parallels one end of these pits. The ingots are lifted from the furnaces by the soaking pit crane and are delivered to the blooming mill entering table. The 35-inch reversing blooming mill, Fig. 12, is driven by a double cylinder reversing engine, the cylinders of which are 42 inches in diameter and 60-inch stroke. Both the mill and the engine were built by Mackintosh, Hemphill & Co., Pittsburgh. The rolls are adjusted by a 75-horsepower reversing motor, which operates the screw-down, and during the process of rolling the ingots and slabs are handled by a hydraulic manipulator. The blooming mill has a capacity for breaking down ingots to slabs 1½ x 8 inches, and billets, 4 x 4 inches. The entry and exit tables of the mill are operated by electric induction drives which, together with the hydraulic manipulator, were built by the Wheeling Mold & Foundry Co., Wheeling, W. Va. From the run-out table the rolled product is delivered to a steam-hydraulic shear which has a capacity for cutting 10 x 30-inch slabs and 17 x 17-inch billets. Space has been reserved in this building for the future installation of a sheet bar mill.

From the blooming mill, slabs are delivered to the plate mill located in an adjoining building, which is 90 x 740 feet and has lean-tos on either side, 37 and 47 feet wide, respectively. The three-high plate mill has rolls 30 x 84 inches and is driven by a 44 x 60-inch Corliss engine. Both the mill and the engine were built by Mackintosh, Hemphill & Co., Pittsburgh. The tilting tables are hydraulically operated and are driven by two small, double-cylinder reversing engines. While the slabs are still at a red heat they are conveyed from the shears in the blooming mill to the three natural gas fired heating furnaces in the plate mill building, as shown in Fig. 14. The slabs are charged and withdrawn from the furnaces by an improved type of electric charging and drawing crane. The mill has a capacity for rolling plates in varying widths up to 78 inches and in lengths up to 480 inches. After the plates are rolled they are passed through a series of straightening or leveling rolls and are then delivered

FIG. 4—JOBBING AND SHEET MILL WAREHOUSE

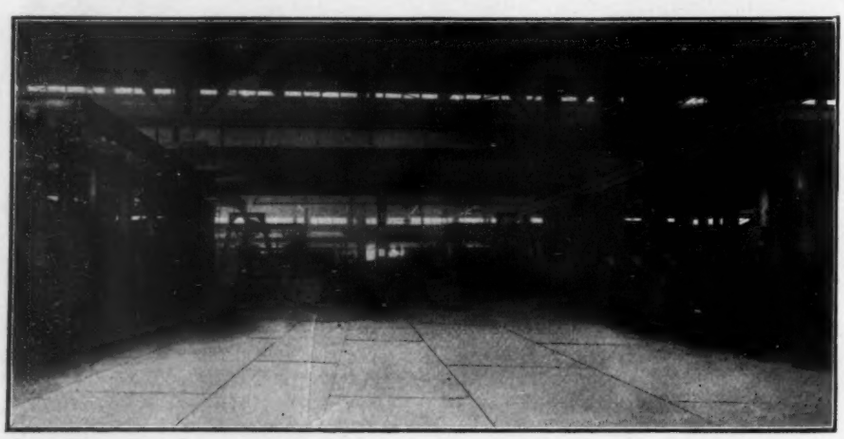


FIG. 3—THE JOBBING MILL HEATING FURNACES

to a cooling table equipped with electrically-operated rollers. At the end of the cooling table the plates are marked off into the various sizes into which they are to be sheared and are again stamped with the original heat number for identification. A number of test pieces are cut away from each plate and are delivered to the laboratory for chemical and physical tests. The shearing department is equipped with cut-off, slitting, circular and several small shears for cutting sketch plates for special requirements. After the plates have been cut to size they are weighed and loaded into cars for shipment. The plate shipping department is commanded by two 10-ton and one 15-ton crane, built by the Morgan Engineering Co., Alliance, O.

FIG. 6—ANNEALING FURNACES, LEVELING MACHINE AND COOLING TABLE IN THE SHEET AND JOBBING MILL DEPARTMENT

The 18-inch, three-high bar mill is operated by a 32 x 54-inch Corliss engine, furnished by the Hooven-Owens-Rentschler Co., Hamilton, O. This mill is fully equipped with mechanically-operated entry and run-out tables for handling the product, which consists of patented tie plates. The mill is also provided with an attachment for rolling universal plates if desired. The billets are heated in a continuous furnace equipped with water-cooled skids. This furnace is gas-fired, but is arranged for producer gas if necessary. The billets and slabs are charged into this furnace at one end and are pushed through the furnace over the hearth and are discharged by gravity onto the entering table to the roughing rolls. The billets are delivered to this furnace from the blooming mill on cars, as indicated in Fig. 13. They are lifted from these cars while hot by a magnet furnished by the Electric Controller & Mfg. Co., Cleveland, and are conveyed by a five-ton Morgan crane to a table in front of the entering side of the furnace. From this table the billets are pushed forward into the furnace. This arrangement, which includes the use of the lifting magnet, effects great economies in the handling of these billets. A side view of the furnace, showing the discharge end and a section of the entering table to the roughing rolls, is illustrated in Fig. 11. After being rolled, the tie plates are delivered to a cooling bed in the tie plate punching and shearing department, which is 60 x 340 feet, and is commanded by a 10-ton Morgan crane. After cooling, the tie plates are punched to suit the various rail bases and are cut to the lengths specified in one operation. This department is equipped with a number of punches and shears for this special work.

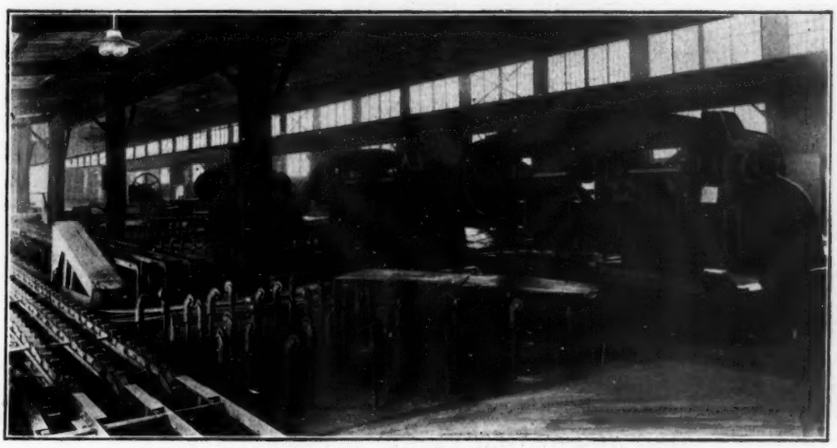


FIG. 5—JOBBING MILL SHEARS

As shown in the ground plan of the plant illustrated on the accompanying insert, the jobbing and sheet mill department is located practically at the extreme end of the plant as compared with the open-hearth furnaces. The building, as previously noted, is 275 x 490 feet and all of the various departments are under one roof. The extreme height of the structure, which is of steel construction throughout, is 58 feet to the peak of the monitor. The roof has a gradual slope from the center and is not broken up by valleys. The building is divided into four bays, the furnace bay being 80 feet wide; hot mill bay, 89 feet wide; annealing bay, 48 feet wide, and the warehouse bay, 58 feet wide. To provide ample room for the warehousing and shipping departments this end of the building has been extended 122 feet, 6 inches. The entire crane equipment was furnished by the Alliance Machine Co., Alliance, O., and consists of a 20-ton crane

FIG. 7—FIRING END OF STOKER-FIRED PAIR HEATING FURNACES

FIG. 8—CHARGING SIDE OF OPEN-HEARTH FURNACES, SHOWING THE CHARGING MACHINE IN THE BACKGROUND

with a 10-ton auxiliary in the furnace bay; a 15-ton auxiliary in the hot mill bay, two 10-ton cranes in the warehouse and two 5-ton mono-rail telphers in the pickling and galvanizing departments. The general arrangement of the jobbing and sheet mills is shown in the accompanying insert, the mills being located on either side of the 44 x 72-inch Corliss engine, which was installed by Mackintosh, Hemphill & Co., Pittsburgh. This engine is geared in the ratio of 2 to 1. The west train of rolls consists of one 30 x 60-inch and one 30 x 66-inch jobbing and plate stands, two sheet mills and one cold-rolling stand. The roughing stands of the jobbing mill are equipped with electrically-operated lifting jacks. The east train of rolls consists of one 28 x 48-inch jobbing stand, three sheet mills and two stands of cold rolls.

FIG. 10—A VIEW OF THE SOAKING PITS

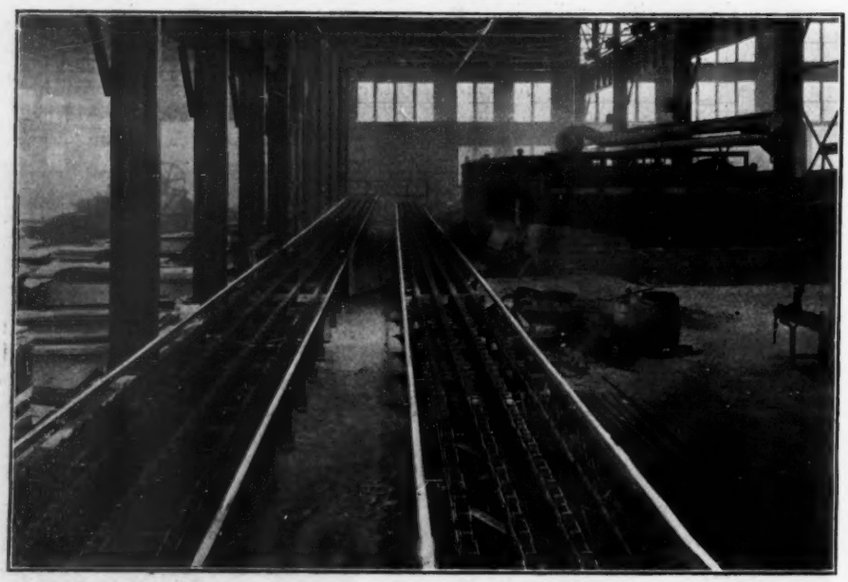


FIG. 9—CONVEYING AND COOLING TABLES IN THE JOBBING AND SHEET MILL DEPARTMENT

A view of the roller's side of the 30-inch sheet mill is illustrated in Fig. 1, and in Fig. 2 is shown the catcher's side. In this view the flywheel of the engine is shown in the background. The product of the jobbing mills, after rolling, is passed through continuous open annealing furnaces for blue-annealing the plates and sheets and after they are discharged from the annealing furnaces they are passed through straightening or leveling rolls and are conveyed by the run-out cooling tables to the shears where they are cut to size and stored for shipment.

A plan view showing the arrangement of the heating, open annealing and box annealing furnaces is illustrated in Fig. 20. It will be noted that the mills are centrally located between the heating and open annealing furnaces. At the opposite end of the plant are located the 12 box annealing furnaces. Two of the three slab heating furnaces are 8 feet, 6 inches x 21 feet, and the third is 7 feet, 6 inches x 19 feet. These furnaces are fired with producer gas. In addition, at this side of the plant, are located five pair furnaces and five double sheet furnaces. These are stoker-fired from the rear, as illustrated in Fig. 7. A view of the slab heating furnaces is shown in Fig. 3. The three continuous annealing furnaces are at the delivery side of the sheet and jobbing mills, as illustrated is Fig. 20. Two of these furnaces are 9 feet, 6 inches x 20 feet, and the third is 8 feet x 20 feet. A view of one of these furnaces, showing the run-out to the conveyor, which delivers the sheets to the straightening rolls is illustrated in Fig. 6. The box annealing furnaces are arranged in pairs, 17 x 21 feet in size, with stoker pits between each pair, as illustrated in Fig. 20. Each furnace has a capacity for one box of sheets. A front view of a pair of these furnaces, showing the cast iron ball

runways in the foreground, is illustrated in Fig. 19. A view of one of the stoker pits is shown in Fig. 18. This clearly illustrates the stoker operating mechanism, which is similar for all of the furnaces. On the five sheet mills, sheets are rolled varying from Nos. 12 to 30 gage and in widths up to 48 inches. A view of the double conveyor and sheet cooling beds serving the open annealing furnaces, is illustrated in Fig. 9. These conveyors are 350 feet and 400 feet respectively.

Pickling and Galvanizing Plant

The pickling and galvanizing department is located at one end of the warehouse and shipping bay, as illustrated in the accompanying insert. For pickling the sheets, four vats are provided which have a capacity for 54-inch stock. Each vat is served by an electrically-driven plunger. From the pickling vats the sheets are delivered by mono-rail to the three water tanks and then to three muriatic acid tanks. The sheets are then passed through galvanizing pots, three of which have been installed, and after passing through the levelers are conveyed to the run-out and cooling tables. A general view of the jobbing and sheet mill warehouse is shown in Fig. 4 and in Fig. 5 are illustrated a number of the jobbing mill shears. In addition to the other equipment in the sheet shearing department, are corrugating, crimping and corrugated curving machines.

Boiler Houses

Steam for operating the plant is generated in three boiler houses having a capacity of approximately 3,000 horsepower each and the electricity is generated in a central power station. The 23 boilers in the three boiler houses are of 387 horsepower capacity each and are of the Sterling water tube type, equipped with chain grate stokers. The coal is unloaded from the railroad cars and is discharged into large receiving hoppers underneath the tracks close to the boiler houses. The coal is then fed into crushers and is lifted to the storage bins or is distributed into overhead bunkers which extend in front of the boilers. A view of one of the boiler houses, showing the stokers and spouts from the overhead bunkers is illustrated in Fig. 24. The coal-handling plant for the new jobbing mill boiler house also handles the coal for the gas producers and the new jobbing mill sheet and pair furnaces which are stoker-fired. The ashes from all of the stokers are collected in cars which operate in tunnels underneath the boiler houses. These cars discharge into skip hoists which dump their contents into an ash storage bin located over one of

FIG. 12—THE 35-INCH BLOOMING MILL

FIG. 11—CONTINUOUS BILLET HEATING FURNACE, SHOWING THE DISCHARGE END

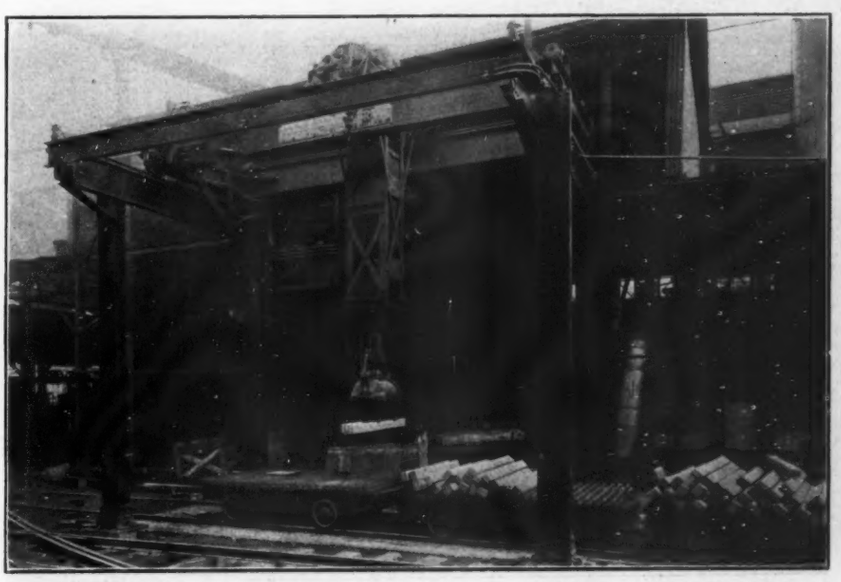


FIG. 13—LIFTING MAGNET FOR CONVEYING THE BILLETS FROM THE CARS TO THE ENTERING SIDE OF THE CONTINUOUS BILLET HEATING FURNACE

FIG. 14—SLAB HEATING FURNACES FOR THE PLATE MILL

the railroad tracks. Each boiler house is provided with McDonough automatic regulators for maintaining a constant steam pressure and water level on each boiler, heaters for the feed water, and compound duplex boiler feed pumps in duplicate.

Power Station

The power station equipment consists of two 250-kilowatt, 250-volt direct current generators, direct connected to high-speed side crank engines; one 500-kilowatt, 250-volt direct current, mixed flow steam turbine; two large cross-compound, two-stage air compressors; two hydraulic pumps which furnish power for the hydraulically-operated machinery throughout the plant and operate at a pressure of 600 to 750 pounds per square inch. In addition, this station contains the auxiliary apparatus for operating the turbines condensing. The exhaust steam for operating the turbines at low pressure is furnished by the engines operating the bar and plate mills. The power house piping is so arranged that during periods when the bar and plate mill engines are shut down the exhaust from the power house pumps, engines, etc., may be utilized to operate the turbines. Sufficient steam is obtained from these units to operate one turbine under full load.

Water Supply

The water supply is taken from the Ohio river, near the banks of which is located a waterproof concrete dry well, 24 feet in diameter and 70 feet deep. The bottom of the well is within 10 feet of the river's low water mark, and here are located two motor-driven centrifugal pumps, each having a capacity of 1,500 cubic feet per minute. These pumps deliver the water into an artificial lake, 60 feet above the river's low-water mark. The lake varies in depth from 3 to 30 feet and covers an area of about 40 acres. From the lake, which is used as a cooling and settling basin, the water is piped to a large gravity well located back of the power house. Here have been installed two cross-compound crank and flywheel pumps with a capacity of 1,500 gallons per minute, which lift the water from the gravity well to a 100,000-gallon capacity iron tank located at the top of a 70-foot tower directly over the pump. Condensing water for the turbine is taken from this well and is delivered to the con-

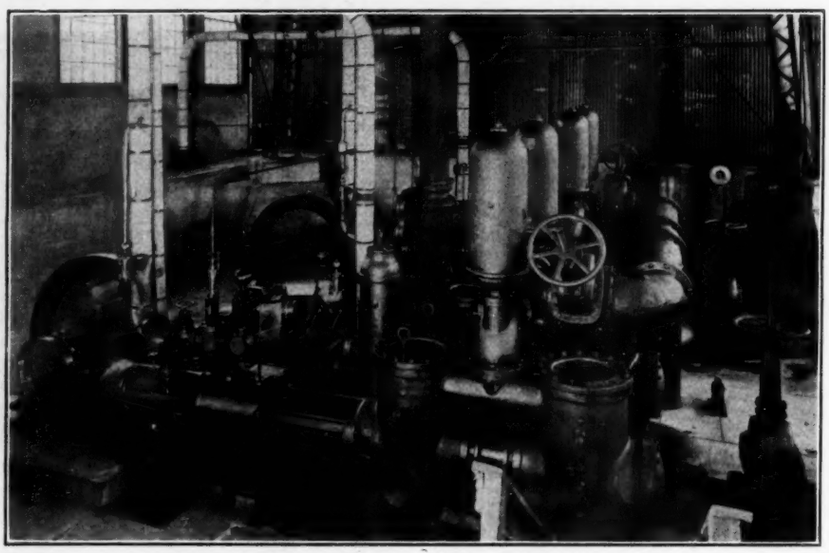


FIG. 16—THE PUMPING PLANT

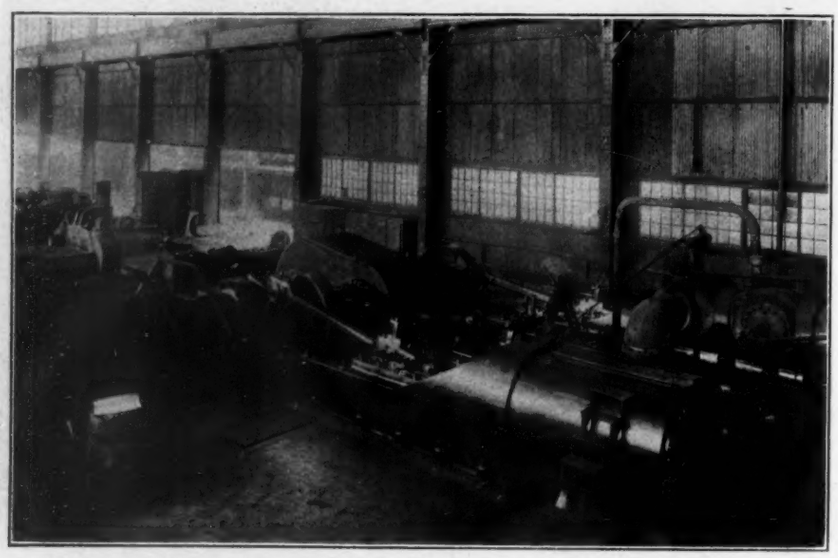


FIG. 15—REVERSING ENGINE FOR THE BLOOMING MILL

denser by two motor-driven centrifugal pumps.

The roll and machine shop for the bar mill is 40 x 110 feet. A view of this department is illustrated in Fig. 17 and in the foreground is shown a tilting, metal cutting band saw. The two gas producers, which furnish the gas for the slab heating furnaces, are of the Hughes type, and were built by the Wellman-Seaver-Morgan Co., Cleveland. A well-equipped machine shop is also operated for building tools and for making the necessary plant repairs. Gray iron and steel foundries also are operated which are well-equipped for making both large and small castings to meet the requirements of the plant.

All the pig iron and scrap used in the open-hearth department is handled in the raw material storage building by cranes equipped with lifting magnets. This building is 65 x 320 feet and on either end of the structure is a 360-foot open runway containing two standard-gage tracks over which the material is received. The yards are adequately equipped for handling the inbound and outbound freight and the material is transferred from one department to another over standard gage tracks laid with 70-pound rails. The total length of trackage approximates 7 miles and the rolling stock consists of six locomotives varying from 20 to 60 tons; 25 40-ton flat and gondola cars as well as numerous charging box and hot metal cars for handling the raw and finished materials. Side tracks from the Southwestern division of the Baltimore & Ohio and the Norfolk & Western railroads insure ample shipping facilities.

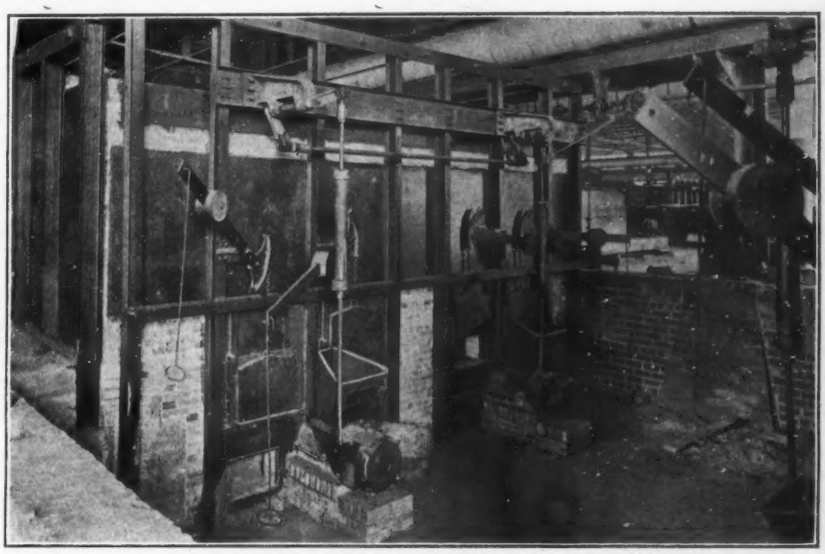


FIG 18—END VIEW OF BOX ANNEALING FURNACES SHOWING THE STOKERS

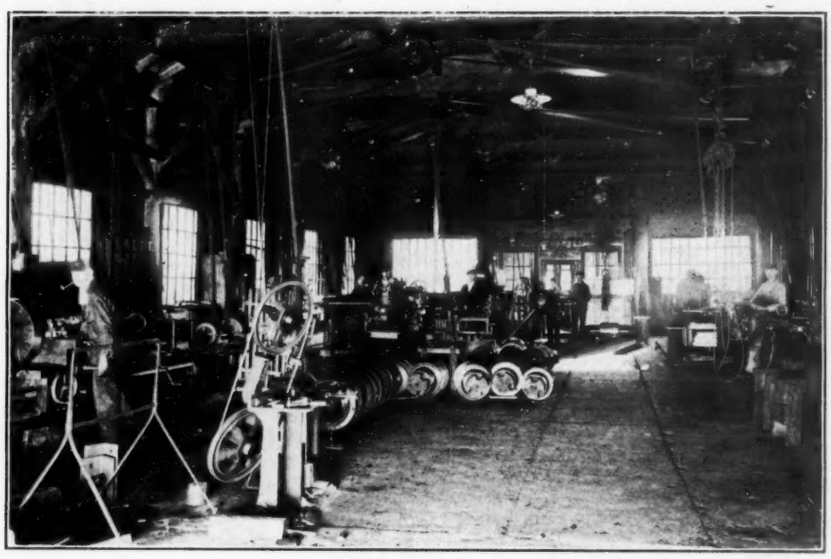


FIG. 17—BAR MILL ROLL AND MACHINE SHOP

Steel Rivets[1]

By D. J. Champion

Too much importance must not be placed on the very interesting, but misleading test for rivets, of nicking and bending. It is a test intended for iron, not steel. Good iron is fibrous in structure and will stand the test admirably, whereas steel may be of a granular structure and, consequently, should not be expected to stand this test like iron. If you are in doubt as to the superiority of one steel rivet over another and you are inclined to test the rivet by nicking and bending, I would suggest that you subject the two rivets to be

[1]From a paper presented at the New Orleans convention of the American Boiler Manufacturers' Association.

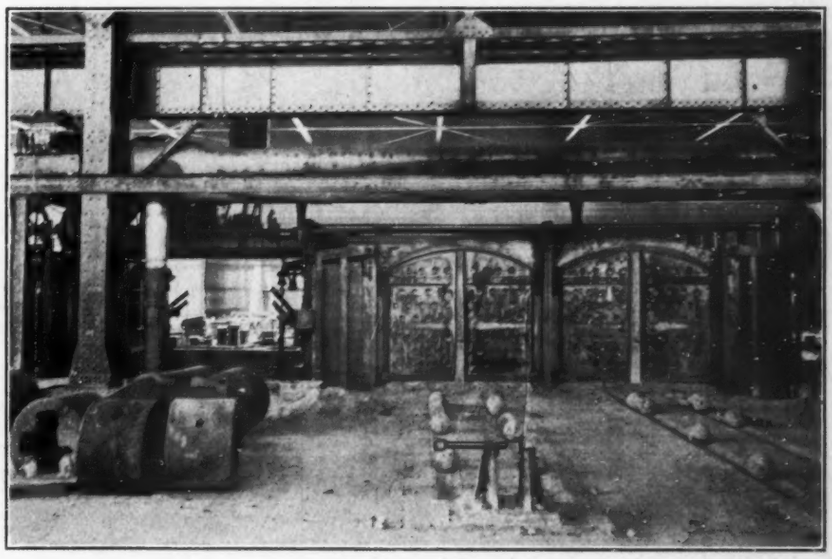


FIG. 19—FRONT VIEW OF A PAIR OF BOX ANNEALING FURNACES

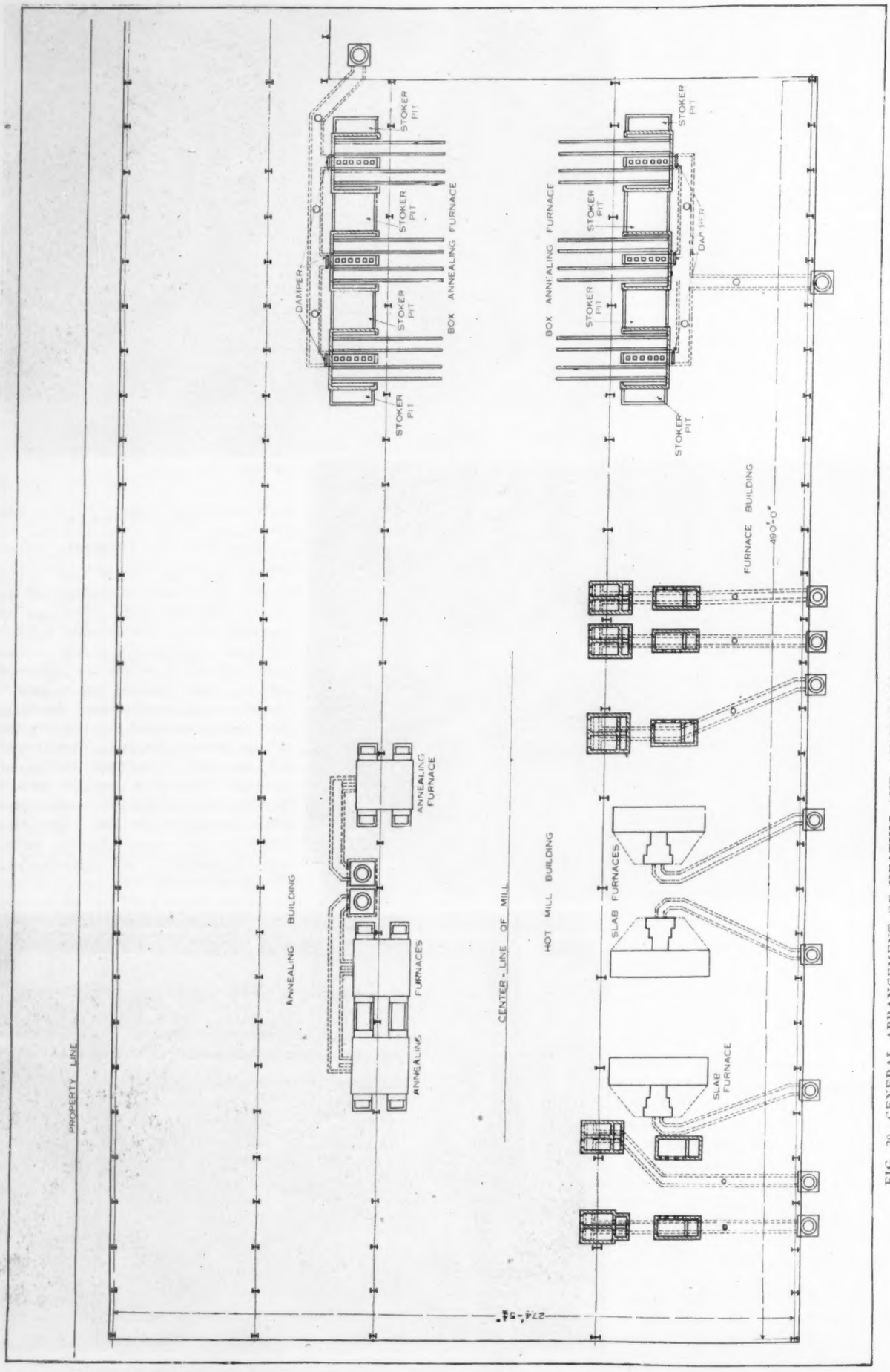
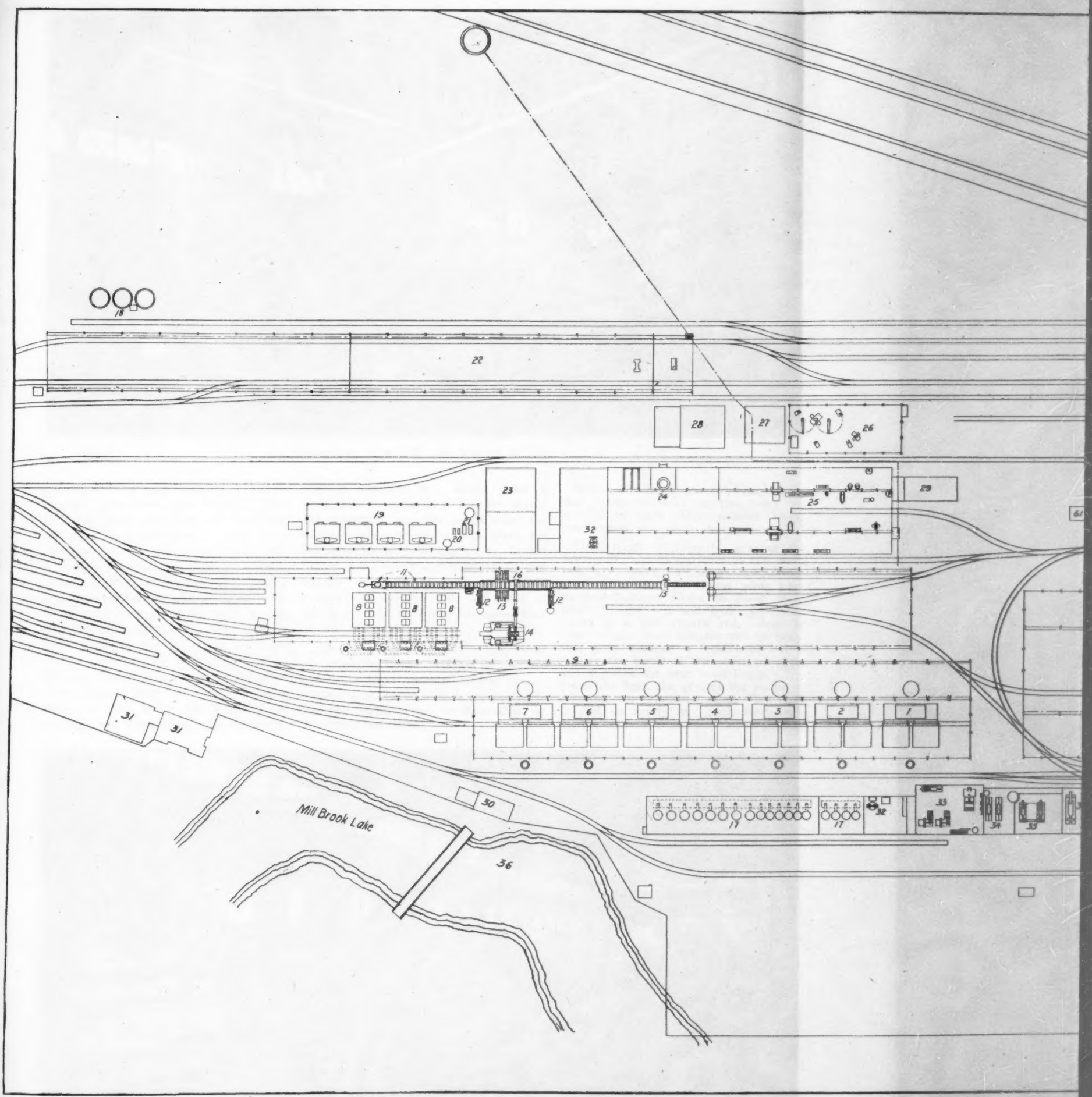
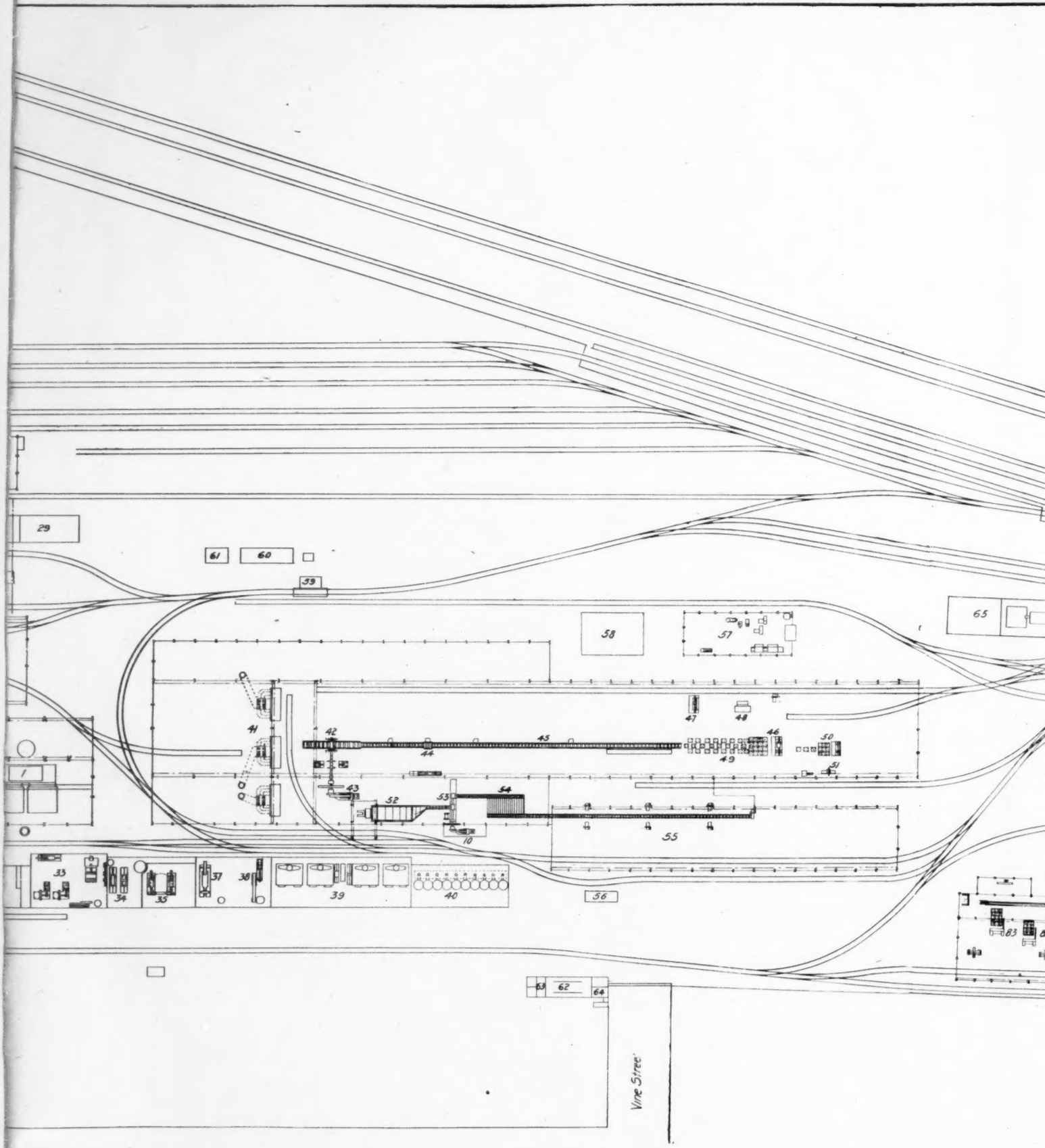


FIG. 20—GENERAL ARRANGEMENT OF HEATING AND ANNEALING FURNACES IN THE JOBBING AND SHEET MILL DEPARTMENT



GROUND PLAN, SHOWING THE ARRANGEMENT OF THE VARIOUS DEPARTMENTS OF THE PORTSMOUTH STEEL CO.'S PLANT. THIS PLAN VIEW SHOWS THE

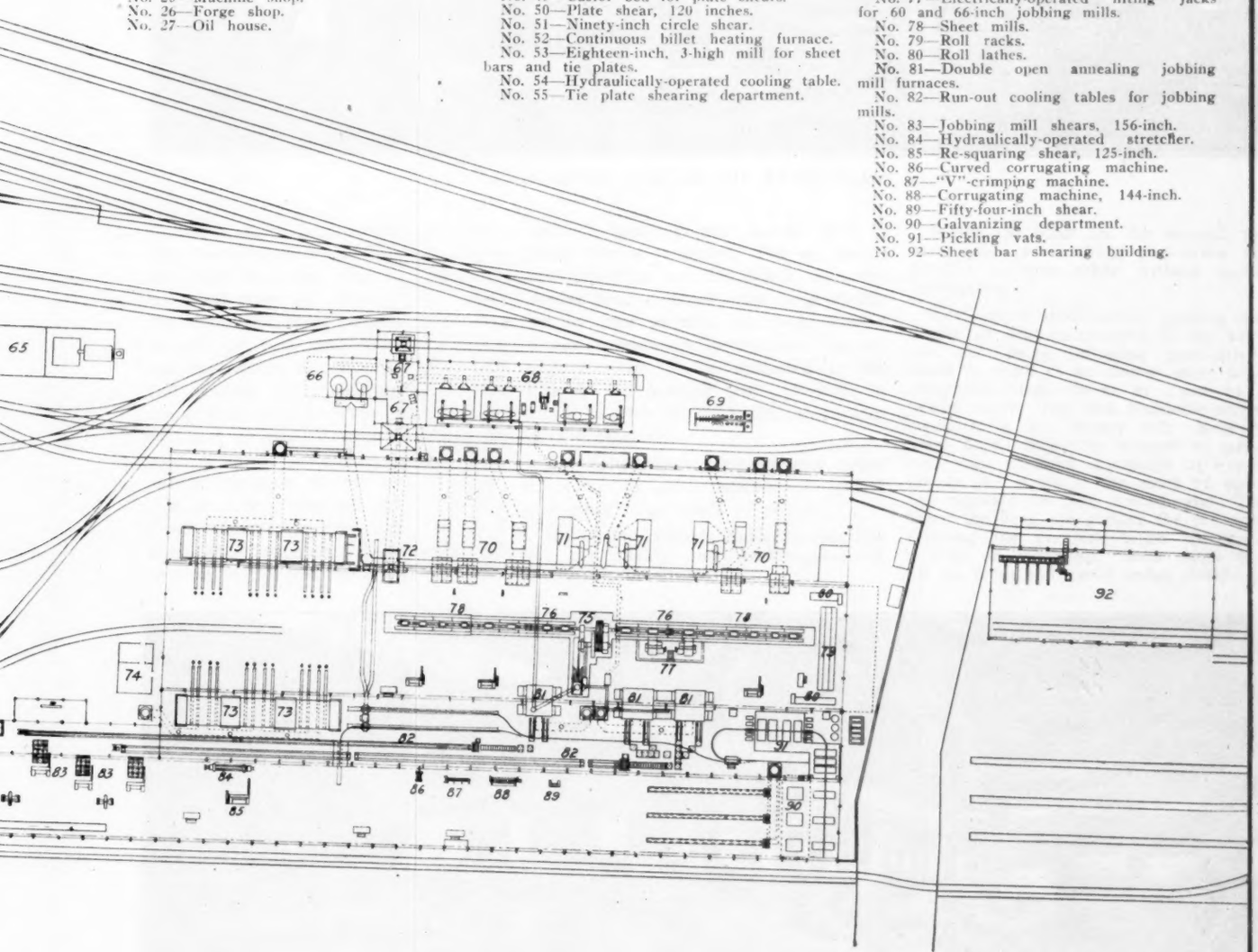
Insert, The Iron Trade Review, March 28, 1912.



HIS PLAN VIEW SHOWS THE LOCATION AND GENERAL ARRANGEMENT OF THE OPEN-HEARTH FURNACES, BLOOMING, PLATE AND BAR MILLS,

Key to Ground Plan of Portsmouth Steel Co.'s Plant

Nos. 1 to 7—Sixty-ton open-hearth furnaces.
No. 8—Three 4-hole soaking pits.
No. 9—Pouring platform in open-hearth building.
No. 10—Bar mill engine, 32 x 54 inches.
No. 11—Ingot tilter and entering table for blooming mill.
No. 12—Induction drives for reversing tables of blooming mill.
No. 13—Manipulator.
No. 14—Blooming mill reversing engine.
No. 15—Steam-hydraulic slab and billet shear.
No. 16—Thirty-five-inch blooming mill.
No. 17—Gas producers for open-hearth furnaces and soaking pits.
No. 18—Fuel oil tanks.
No. 19—No. 2 boiler house for the blooming mill.
No. 20—Feed water pumps.
No. 21—Hydraulic pumps and accumulator.
No. 22—Stock storage.
No. 23—Pattern storage.
No. 24—Ten-ton cupola in gray iron foundry.
No. 25—Machine shop.
No. 26—Forge shop.
No. 27—Oil house.
No. 28—Store room.
No. 29—Electrical repair shop.
No. 30—Physical and chemical laboratory.
No. 31—General office.
No. 32—Clay grinding mills.
No. 33—Central power station.
No. 34—Hydraulic pumps.
No. 35—Pumping plant.
No. 36—Artificial lake.
No. 37—Air compressor.
No. 38—Emergency lighting unit.
No. 39—Plate and bar mill boiler house.
No. 40—Gas producers for plate and bar mill furnaces.
No. 41—Slab heating furnaces for plate mill.
No. 42—Three-high plate mill, 30 x 84 inches.
No. 43—Corliss engine, 44 x 60 inches.
No. 44—Leveling or straightening rolls.
No. 45—Run-out table.
No. 46—Electrically-driven plate shear, 144 inches, for stock up to 1½ inches thick.
No. 47—Hydraulic shear.
No. 48—Scale.
No. 49—Castor bed for plate shears.
No. 50—Plate shear, 120 inches.
No. 51—Ninety-inch circle shear.
No. 52—Continuous billet heating furnace.
No. 53—Eighteen-inch, 3-high mill for sheet bars and tie plates.
No. 54—Hydraulically-operated cooling table.
No. 55—Tie plate shearing department.
No. 56—Punch and die tempering department.
No. 57—Tie plate roll and machine shop.
No. 58—Shipping offices.
No. 59—One-hundred-ton track scale.
No. 60—Carpenter shop.
No. 61—Tool house.
No. 62—Main entrance for employes.
No. 63—Timekeeper's office.
No. 64—Police headquarters.
No. 65—Grease house.
No. 66—Mechanically-fired gas producers.
No. 67—Coal and ash-handling plant.
No. 68—No. 3 boiler house.
No. 69—Toilet.
No. 70—Sheet and pair heating furnaces.
No. 71—Slab heating furnaces for the jobbing mills.
No. 72—Ash-collecting hopper.
No. 73—Box annealing furnaces.
No. 74—Sheet and jobbing mill superintendent's office.
No. 75—Corliss engine, 44 x 72 inches, geared 2 to 1.
No. 76—Thirty-inch jobbing mills.
No. 77—Electrically-operated lifting jacks for 60 and 66-inch jobbing mills.
No. 78—Sheet mills.
No. 79—Roll racks.
No. 80—Roll lathes.
No. 81—Double open annealing jobbing mill furnaces.
No. 82—Run-out cooling tables for jobbing mills.
No. 83—Jobbing mill shears, 156-inch.
No. 84—Hydraulically-operated stretcher.
No. 85—Re-squaring shear, 125-inch.
No. 86—Curved corrugating machine.
No. 87—"V"-crimping machine.
No. 88—Corrugating machine, 144-inch.
No. 89—Fifty-four-inch shear.
No. 90—Galvanizing department.
No. 91—Pickling vats.
No. 92—Sheet bar shearing building.



AR MILLS, GAS PRODUCER PLANTS, BOILER HOUSES, CENTRAL POWER STATION AND THE NEW JOBBING AND SHEET MILLS

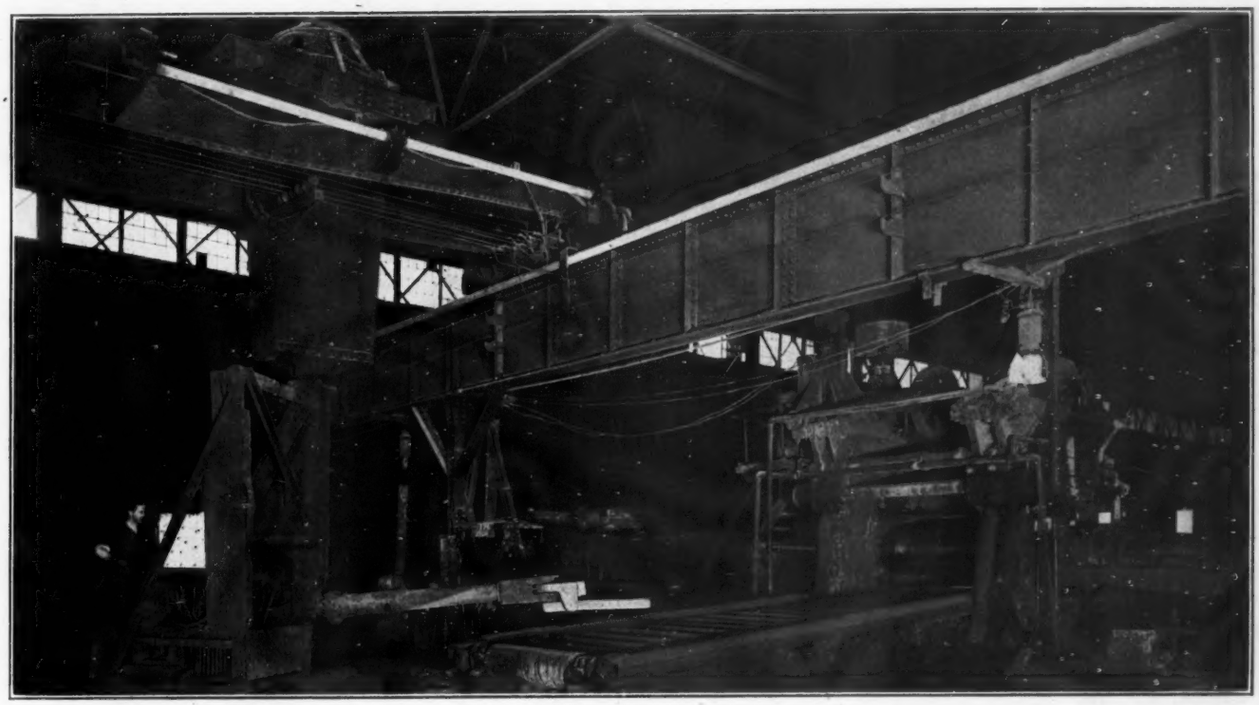


FIG. 21—ENTRY SIDE OF THE 3-HIGH PLATE MILL

compared to a heat suitable for driving, and then allow them to cool. Then nick and bend and you will find that the good rivet will show a good, clean fracture, free from crystallization; but it will not bend and show a coarsely fibrous fracture like iron. The nicking and bending test should never be used on a steel rivet to show fiber, as the structure of a good steel rivet may be finely granular instead of fibrous. Fine, fibrous structure is, of course, noticeable in a steel bar of small diameter after coming from the rolls. At this stage, the bar under the nicking and bending test would bend flat on itself without breaking and would show a finely fibrous structure. But we should not expect to get this result after the double heating which must be given the bar in order to make the rivet. United States government specifications do not require rivets to be subjected to the nicking and bending test. If made at all, it is only to show the appearance of the fracture.

The following suggestions may prove of value to some makers of boilers and other large users of rivets:

Hold some reliable maker responsible for the quality and workmanship of the rivets you drive.

Where the holes are not reamed, see that inside surfaces of the holes are parallel to each other without undue overlapping.

Heat rivets intelligently, grading the degree of heat to conform to the work you are doing, allowing hand-driven rivets to come to an almost white heat, pneumatic-driven rivets to come to a bright cherry red and hydraulic-driven rivets to a dull cherry red. Bear in mind at all times the amount of pressure your machine is capable of exerting on the rivets at the point of upset and regulate the heat accordingly. The lower the heat, the greater the pressure, relaxing the pressure when the rivet is cold, or nearly so. Such rivets will fill the holes and avoid undue shrinking,

FIG. 22—PLATE MILL RUNOUT TABLE AND PLATE MILL WAREHOUSE

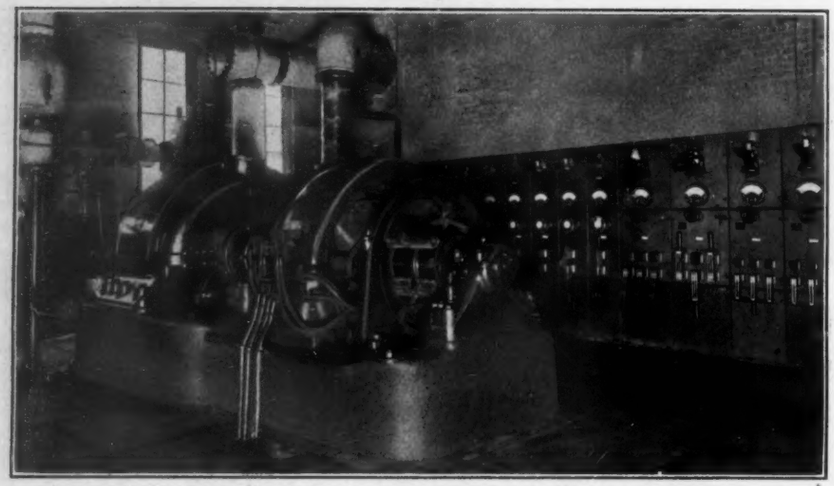


FIG. 23—TURBO-GENERATOR SET IN THE CENTRAL POWER STATION

and possibly, calking. When high pressure work is being riveted, ream the holes 1/32 inch full only, as tighter work can then be done.

Never continue hammering, on either end of the rivet, until it is blue.

Never try to fill a hole with a rivet smaller than the regular diameter required for such hole, which in all good work is 1/32 inch larger, bearing in mind that steel expanded by compression, as in the case of a rivet shank expanded to fill the hole that is more than 1/16 inch larger, is materially weakened in all its qualities of strength. Therefore, the closer the fit, the tighter and stronger the joint.

Never use heavy penumatic tools on small rivets. In other words, never use a tool out of proportion to the size of the rivet.

Never drive a cold-made rivet cold without first annealing.

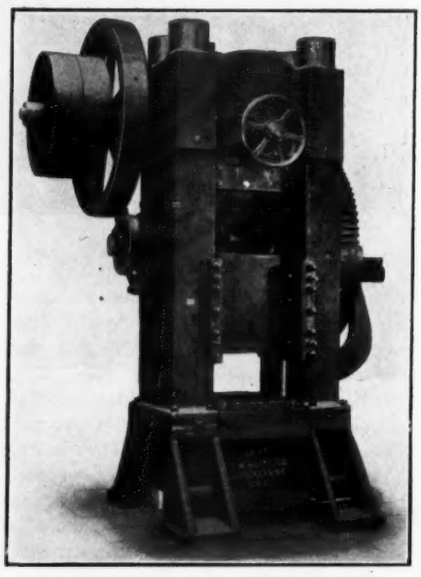
Never introduce a high pressure blast into a rivet-heating furnace unless the flame is broken by a fire wall, and even then a graduating valve should be used, reducing the pressure to a maximum of 15 pounds, bearing in mind that only sufficient rivets be placed in the fire as can be conveniently handled by the driver without allowing them to soak too long, or to become scaled.

Never allow your rivets to soak in the fire, either during the noon hour, or over night. If a cessation of work is contemplated, draw them out of the fire, and do not replace them.

A Knuckle Joint Press

A knuckle joint press, which has a capacity of 800 tons, built by the E. W. Bliss Co., Brooklyn, N. Y., is shown in the accompanying illustration. This press is especially adapted for heavy stamping and embossing. The knuckle joint principle imparts a powerful movement to the slide at the end of the stroke with the minimum amount of friction and power. Furthermore, at the end of the stroke, when the work is being done, a slow movement is provided which is desirable when it is required to have the metal flow while under pressure.

The bed of the machine is stationary and the toggle links are placed above the slide in the same position as pitmans in an ordinary crank press and are operated by a crankshaft at the rear of the press. This construction not only permits of imparting a longer stroke to the slide, but also allows the use of positive knock-out attachments in the bed and cross-bar knock-outs in the slide. The jaw clutch has three



A LARGE KNUCKLE JOINT PRESS

engaging points and is operated by a foot treadle at the right of the machine. The necessary adjustment for dies and pressure is obtained by a taper wedge. This wedge is adjusted by a screw which in turn is operated by a hand wheel.

The machine is of tie-rod construction, the bed and crown piece each being separate castings. The side housings, which take any side strain and provide bearing surfaces for the slide and crankshaft, also are separate and are of box section. Through the side housings extend four, large, vertical tie rods which bind the machine together and take the entire strain when the press is doing its work. If the press should become stalled on its center, the tie rods can be heated and expanded through suitable openings, thereby releasing the press.

Some of the principal dimensions of the press follow: Distance between uprights, 28 inches; stroke of slide, 2 inches; area of slide flange, 16 x 22 inches; area of top of bed, 27 x 34 inches, and total weight, 45,000 pounds.

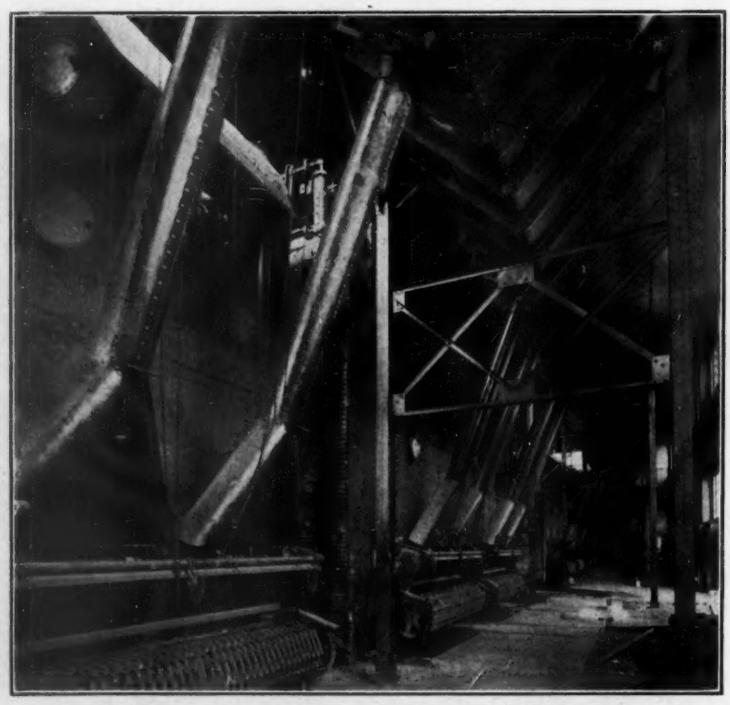


FIG. 24—AUTOMATIC STOKERS IN NO. 3 BOILER HOUSE, SHOWING THE COAL BUNKER AND SPOUTS

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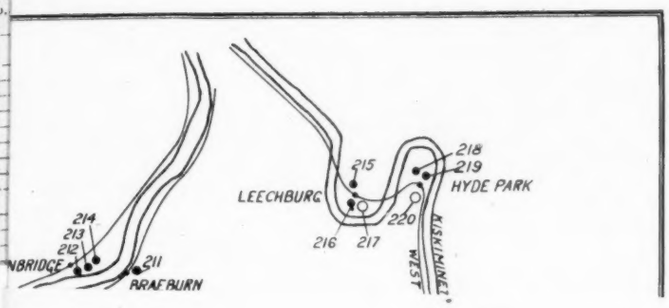
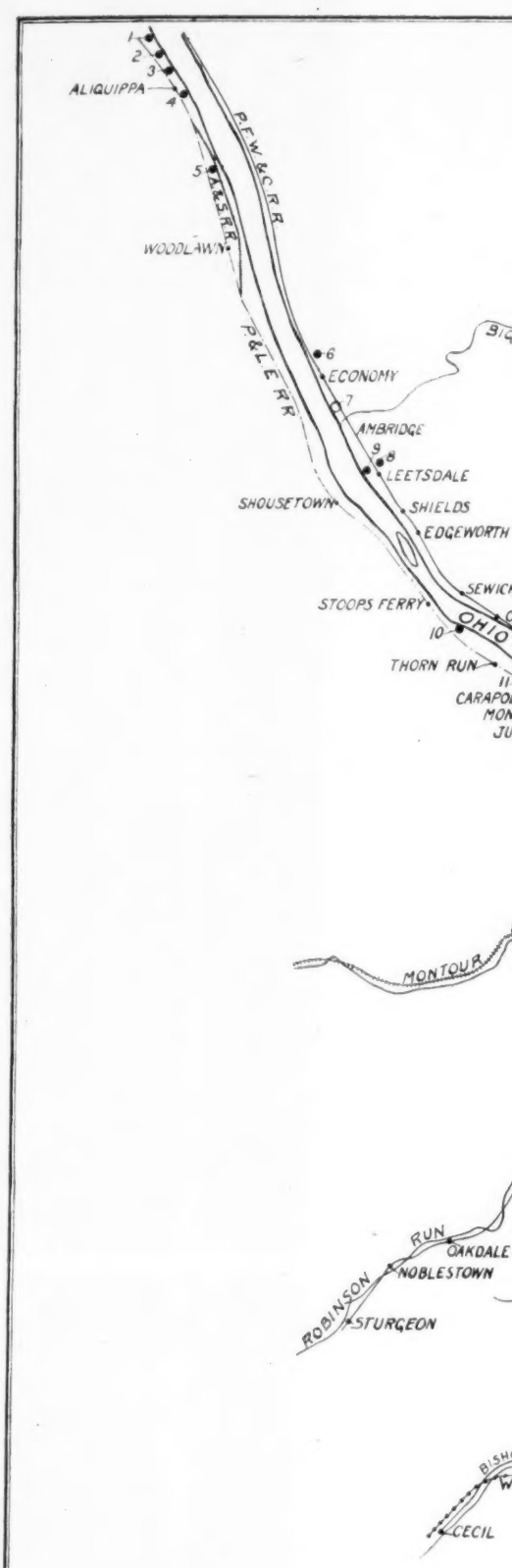


Map of the Pittsburgh Dist

Steel W

Numerical List of Works with Railroad Connections

Index No.	Name.	Location	Railroads
1	Crucible Steel Co. of America. Aliquippa Works).	Aliquippa	P. & L. E.
2	J. G. Russel Shovel Works	Aliquippa	P. & L. E.
3	Vulcan Crucible Steel Co.	Aliquippa	P. & L. E.
4	Kidd Bros. & Burgher	Aliquippa	P. & L. E.
5	Jones & Laughlin Steel Co.	Woodlawn	P. & L. E.
6	Pittsburgh Steel Construction Co.	Economy	P. F. W. & C.
7	American Bridge Co. (Ambridge Plant).	Ambridge	P. F. W. & C.
8	Tate, Jones Co.	Leetsdale	P. F. W. & C.
9	Riter-Conley Mfg. Co. (Leetsdale Plant).	Leetsdale	P. F. W. & C.
10	Duquesne Steel Foundry Co.	Coraopolis	P. & L. E.
11	W. S. Tyler Co.	Coraopolis	P. & L. E.
12	Lewis Foundry & Machine Co.	Groveton	P. & L. E.
13	Graham Nut Co.	Neville Island	P. C. & Y.
14	Carnegie Steel Co. (Neville Furnace).	Neville Island	P. C. & Y.
15	Pressed Steel Car Co. (McKees Rocks Plant).	McKees Rocks	P. C. & Y.
16	Central Car Wheel Co.	McKees Rocks	P. C. & Y.
17	Pennsylvania Malleable Co.	McKees Rocks	P. C. & Y.
18	Carnegie Steel Co. (Schoen Steel Wheel Co.).	McKees Rocks	P. C. & Y.
19	Fort Pitt Spring & Mfg. Co.	McKees Rocks	P. C. & Y.
20	James McKay & Co.	McKees Rocks	P. C. & Y.
21	Fort Pitt Malleable Iron Co.	McKees Rocks	P. C. & Y.
22	Taylor-Wilson Mfg. Co.	McKees Rocks	P. C. & Y.
23	Pittsburgh Pipe & Iron Co.	McKees Rocks	P. & L. E.
24	Lockhart Iron & Steel Co.	McKees Rocks	P. C. & Y.
25	Pittsburgh Forge & Iron Co.	N. S. Pittsburgh	P. F. W. & C.—B. & O.
26	Pressed Steel Car Co. (Allegheny Plant).	N. S. Pittsburgh	P. F. W. & C.—B. & O.
27	P. Wall Mfg. Co.	N. S. Pittsburgh	P. F. W. & C.
28	American Nut & Bolt Fastener Co.	N. S. Pittsburgh	P. F. W. & C.—B. & O.
29	Standard Sanitary Mfg. Co. (Standard Plant).	N. S. Pittsburgh	P. F. W. & C.—B. & O.
30	Riter-Conley Mfg. Co. (Allegheny Plant).	N. S. Pittsburgh	P. F. W. & C.—B. & O.
31	Pennsylvania Casting & Machine Co.	N. S. Pittsburgh	P. F. W. & C.
32	Carnegie Steel Co. (Allegheny Furnace).	N. S. Pittsburgh	P. F. W. & C.
33	Superior Mfg. Co.	N. S. Pittsburgh	P. F. W. & C.
34	Pittsburgh Stove & Range Co. (Division A).	N. S. Pittsburgh	B. & O.
35	American Locomotive Co. (Pittsburgh Works).	N. S. Pittsburgh	P. F. W. & C.—B. & O.
36	Enterprise Foundry Co.	N. S. Pittsburgh	P. F. W. & C.
37	Rosedale Foundry Co.	N. S. Pittsburgh	P. F. W. & C.—B. & O.
38	Heyl & Patterson	N. S. Pittsburgh	B. & O.
39	C. B. Albree Iron Works.	N. S. Pittsburgh	P. F. W. & C.
40	—		
41	Independent Bridge Co.	N. S. Pittsburgh	B. & O.
42	Crucible Steel Co. of America (LaBelle Works).	N. S. Pittsburgh	B. & O.
43	Carnegie Steel Co. (McCutcheon Works).	N. S. Pittsburgh	B. & O.
44	Duff Mfg. Co.	N. S. Pittsburgh	P. F. W. & C.
45	Damascus Bronze Co.	N. S. Pittsburgh	B. & O.
46	Hall Steam Pump Co.	N. S. Pittsburgh	B. & O.
47	Westinghouse Electric & Mfg. Co.	N. S. Pittsburgh	P. F. W. & C.
48	Crucible Steel Co. of America (Singer Works).	S. S. Pittsburgh	P. & L. E.
49	Carnegie Steel Co. (Painter Works).	S. S. Pittsburgh	P. & L. E.
50	Union Foundry & Machine Co.	S. S. Pittsburgh	P. & L. E.
51	Clinton Iron & Steel Co.	S. S. Pittsburgh	P. & L. E.—P. C. C. & St. L.
52	Wilson-Snyder Mfg. Co.	Pittsburgh	P. C. C. & St. L.
53	Pilworth Porter & Co.	S. S. Pittsburgh	A. & S. S.
54	A. M. Byers & Co.	S. S. Pittsburgh	A. & S. S.
55	A. Garrison Foundry Co.	S. S. Pittsburgh	A. & S. S.
56	Oliver Iron & Steel Co.	S. S. Pittsburgh	A. & S. S.
57	American Sheet & Tin Plate Co. (Monon. Works). Tin Plate.	S. S. Pittsburgh	A. & S. S.
58	American Sheet & Tin Plate Co. (Monon. Works). Black Plate.	S. S. Pittsburgh	A. & S. S.
59	John Eichleay Jr. & Co.	S. S. Pittsburgh	A. & S. S.
60	Jones & Laughlin Steel Co.	S. S. Pittsburgh	P. V. & C.
61	National Tube Co. (Penna. Works).	Pittsburgh	Mon. Con.—B. & O.
62	Jones & Laughlin Steel Co. (Soho Furnace).	Pittsburgh	Mon. Con.
63	Neeley Nut & Bolt Co.	S. S. Pittsburgh	P. & L. E.
64	National Tube Co. (Republic Works).	S. S. Pittsburgh	P. & L. E.
65	Jones & Laughlin Steel Co. (Soho Dept.).	Pittsburgh	Mon. Con.
66	Jones & Laughlin Steel Co. (S. S. Dept.).	S. S. Pittsburgh	Mon. Con.
67	M. Lanz & Son.	S. S. Pittsburgh	Mon. Con.
68	Jones & Laughlin Steel Co. (Eliza Furnace).	Pittsburgh	Mon. Con.
69	National Tube Co. (Continental Works).	Pittsburgh	Mon. Con.—B. & O.
70	American Foundry & Const. Co.	Hazelwood	B. & O.
71	Pittsburgh Smelting & Refining Co.	Glenwood	B. & O.
72	Air Tight Steel Tank Co.	Glenwood	B. & O.
73	Monongahela Iron & Steel Co.	Hays	P. V. & C.—P. & L. E.
74	National Car Wheel Co. (Keystone Branch).	West Homestead	B & O.—P. & L. E. P. V. & C.
75	Mesta Machine Co.	West Homestead	B & O.—P. & L. E. P. V. & C.
76	Carnegie Steel Co. (Howard Axle Works).	Homestead	Union
77	Carnegie Steel Co. (Homestead Works).	Munhall	Union
78	—		
79	—		
80	Carnegie Steel Co. (Carrie Furnaces).	Rankin	Union
81	American Steel & Wire Co. (Rankin Plant).	Rankin	P. & L. E.—B. & O.—Union
82	McClintic-Marshall Construction Co.	Rankin	P. & L. E.—B. & O.
83	Columbia Steel & Shafting Co.	Rankin	P. & L. E.
84	Union Switch & Signal Co.	Swissvale	P. R. R.
85	Nicholson & Co.	Hawkins	P. R. R.
86	Consolidated Expanded Metal Co., Inc.	Rankin	P. & L. E.—B. & O.
87	Acheson Mfg. Co.	Rankin	P. & L. E.—B. & O.
88	Vanadium Mines Co.	Rankin	B. & O.
89	Standard Chain Co. (Braddock Plant).	Braddock	P. & L. E.
90	Braddock Machine & Mfg. Co.	Braddock	P. & L. E.
91	Griswold Wire Co.	Braddock	P. & L. E.
92	Pittsburgh Machine Tool Co.	Copeland	P. R. R.
93	Sterling Steel Foundry Co.	Braddock	P. & L. E.
94	McVay & Walker	Braddock	P. & L. E.
95	American Steel & Wire Co. (Braddock Plant).	Braddock	P. & L. E.
96	Carnegie Steel Co. (Edgar Thomson Works).	Bessemer	Union
97	Westinghouse Machine Co.	East Pittsburgh	P. R. R.
98	Westinghouse Electric & Mfg. Co.	East Pittsburgh	P. R. R.
99	Universal Portland Cement Co.	Universal	P. & L. E.
100	Westinghouse Air Brake Co.	Wilmerding	P. R. R.
101	Westinghouse Foundry Co.	Stewart	P. R. R.
102	Carnegie Steel Co. (Duquesne Works).	South Duquesne	Union
103	American Sheet & Tin Plate Co. (U. S. Wks.).	Demmler	P. & L. E.—B. & O.
104	Firth-Sterling Steel Co.	Demmler	P. & L. E.—B. & O.
105	National Tube Co. (National Works).	McKeesport	McK. Conn.
106	American Sheet & Tin Plate Co. (Wood Wks.).	McKeesport	McK. Conn.
107	McKeesport Tin Plate Co.	Lynch Station	P. & L. E.
108	National Tube Co. (Christy Park Works).	Christy Park	B. & O.
109	National Tube Co. (National Galv. Works).	Versailles	B. & O.
110	Severance Mfg. Co.	Glassport	P. & L. E.
111	Pittsburgh Steel Co. (Glassport Plant).	Glassport	P. & L. E.
112	Pittsburgh Steel Foundry	Glassport	P. & L. E.
113	American Axe & Tool Co. (Glassport Plant).	Glassport	P. & L. E.
114	Morris & Bailey Steel Co.	Wilson	P. V. & C.
115	Monongahela Tube Co.	Wilson	P. V. & C.
116	Clairton Steel Co.	Clairton	P. V. & C.
117	Clark Safe & Vault Co.	Van Kirk	P. & L. E.
118	Liggett Spring & Axle Co.	Monongahela City	P. & L. E.
119	Monongahela Foundry & Forge Co.	Monongahela City	P. V. & C.
120	Monongahela Mfg. Co.	Monongahela City	P. V. & C.
121	Robison Machine Co.	Monongahela City	P. V. & C.
122	Black Diamond Engineering Co.	Black Diamond	P. V. & C.
123	Union Steel Co. (Donora Works).	Donora	P. V. & C.
124	—		
125	Monessen Foundry & Machine Co.	Monessen	P. & L. E.
126	Page Woven Wire Fence Co.	Monessen	P. & L. E.
127	Carnegie Steel Co. (Monessen Works).	Monessen	P. & L. E.
128	American Sheet & Tin Plate Co. (Nat'l. Wks.).	Monessen	P. & L. E.
129	Pittsburgh Steel Co. (Monessen Plant).	Monessen	P. & L. E.
130	Hussey-Binns Shovel Co.	Charleroi	P. V. & C.
131	Follansbee Bros. Co. (Warehouse).	Pittsburgh	P. R. R.
132	Pennsylvania Drop Forging Co.	Pittsburgh	P. F. W. & C.—B. & O.
133	Brown & Co., Inc.	Pittsburgh	P. F. W. & C.—B. & O.
134	Carnegie Steel Co. (Warehouse).	Pittsburgh	B. & O.
135	Carlin Machine & Supply Co.	N. S. Pittsburgh	B. & O.
136	Mackintosh, Hemphill & Co.	Pittsburgh	P. F. W. & C.—B. & O.
137	Zug Iron & Steel Co.	Pittsburgh	P. F. W. & C.—B. & O.
138	Amer. Steel & Wire Co. (Shoenberger Plant).	Pittsburgh	A. V.—B. & O.
139	Oil Well Supply Co.	Pittsburgh	A. V.—B. & O.
140	Pittsburgh Galvanizing Co.	Pittsburgh	A. V.—B. & O.
141	National Supply Co.	Pittsburgh	A. V.
142	Central Foundry Co.	Pittsburgh	A. V.
143	Pittsburgh Valve Foundry & Construction Co. (Machine Shop).	Pittsburgh	A. V.—B. & O.
144	Baird Machine Co.	Pittsburgh	A. V.
145	H. Monroe & Son	Pittsburgh	A. V.
146	T. J. Maloney	Pittsburgh	A. V.
147	Bell Bros.	Pittsburgh	A. V.
148	Reliance Steel Casting Co.	Pittsburgh	A. V.
149	Pittsburgh Valve Foundry & Construction Co. (Pipe Shop).	Pittsburgh	A. V.—B. & O.
150	Marshall Foundry Co.	Pittsburgh	A. V.—B. & O.
151	Russel Machinery Co.	Pittsburgh	A. V.
152	Carnegie Steel Co. (Lower Union Mill).	Pittsburgh	A. V.—B. & O.
153	Russel Machinery Co.	Pittsburgh	A. V.
154	Thos. Carlin's Sons Co.	N. S. Pittsburgh	West Penn—B. & O.
155	Fairbanks Co.	Pittsburgh	P. R. R.
156	McNeil & Bro. Co. (Dipping Plant).	Pittsburgh	P. R. R.—B. & O.
157	Pittsburgh Gage & Supply Co.	Pittsburgh	B. & O.
158	Crucible Steel Co. of America (Park Works).	Pittsburgh	A. V.—B. & O.
159	Carbon Steel Co.	Pittsburgh	A. V.—B. & O.
160	Lawrence Iron & Steel Co.	Pittsburgh	A. V.
161	Iron City Tool Co.	Pittsburgh	A. V.
162	Pittsburgh Foundry & Machine Co.	Pittsburgh	B. & O.



- NOTE -
WORKS OF SUBSIDIARY COMPANIES OF THE UNITED STATES STEEL CORP ARE SHOWN THUS-○

Index No.	Name.	
163	Pittsburgh Rivet Co.	Pit
164	Pittsburgh Cold Rolled Steel Co.	Pit
165	Pittsburgh Conduit Co.	Pit
166	Carnegie Steel Co. (Upper Union Mills).	Pit
167	Pittsburgh Malleable Co.	Pit
168	American Steel Foundries (Pgh. Works).	Pit
169	Carnegie Steel Co. (Clark Works).	Pit
170	McCullough-Dalzell Crucible Co.	Pit
171	Epping-Carpenter Co.	Pit
172	Seaman-Sleeth Co.	Pit
173	Wickes Bros.	Pit
174	Heppenstall Forge & Knife Co.	Pit
175	American Bridge Co. (Shiffler Plant).	Pit
176	McConway & Torley Co. (48th St. Plant).	Pit
177	Crucible Steel Co. of America (Crescent Wks.).	Pit
178	H. K. Porter Co.	Pit
179	—	
180	Carnegie Steel Co. (Lucy Furnaces).	Pit
181	Pittsburgh Spring & Steel Co.	Pit
182	R. D. Nuttall Co.	Pit
183	United Engineering & Foundry Co. (F. Kneeland Dept.).	Pit
184	McConway & Torley Co. (56th St. Plant).	Pit
185	Carnegie Steel Co. (Isabella Furnaces).	Etn
186	Etna Forge & Bolt Co.	Sha
187	Enameled Metals Co.	Sha
188	Spang-Chalfant & Co.	Etn
189	McCance Bros. Co., Inc.	Pit
190	United Engineering & Foundry Co. (Lincoln Dept.).	Pit
191	Pittsburgh Crushed Steel Co.	Pit
192	Union Steel Casting Co.	Pit
193	National Nut & Bolt Co.	Pit
194	Hubbard & Co.	Pit
195	Moorehead Bros. & Co.	Sha
196	Sharpsburg Foundry Co.	Sha
197	Richardson & Co.	Sha
198	Bindley Hardware Co.	Sha
199	T. P. Ferguson Co.	Eas
200	Thos. Carlin's Sons Co.	Asp
201	Verona Tool Works	Ver
202	G. L. Bollinger & Co.	Ver
203	Best Mfg. Co.	Oak
204	W. B. Scaife & Sons Co.	Oak
205	Pittsburgh Tool & Drop Forge Co.	Che
206	Yost Bros.	Hit
207	American Sheet & Tin Plate Co. (Pittsburgh Works).	Ne
208	Union Spring & Mfg. Co.	Ne
209	Pittsburgh Reduction Co.	Ne
210	American Sheet & Tin Plate Co. (Penna Wks.).	Ne

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l Works having Track Connec

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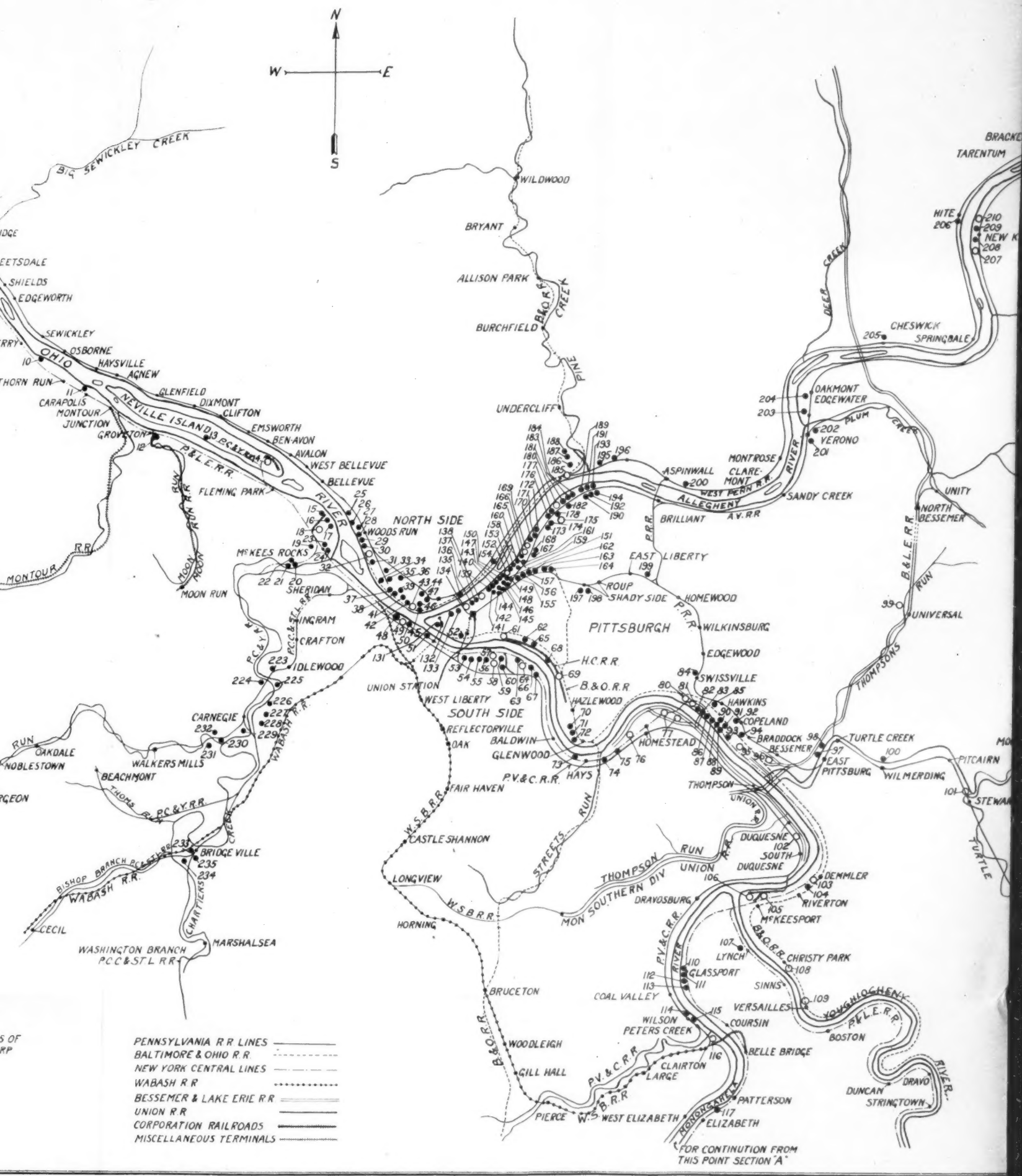


Index No.	Name.	Railroads	Location
211	Braeburn Steel Co.	Braeburn	A. V.
212	J. H. Baker Mfg. Co.	Brackenridge	West Penn
213	Allegheny Steel & Iron Co.	Brackenridge	West Penn
214	Interstate Steel Co.	Brackenridge	West Penn
215	West Leechburg Sheet & Tin Plate Co.	Leechburg	West Penn
216	Pittsburgh Shovel Co.	Leechburg	West Penn
217	American Sheet & Tin Plate Co.	Leechburg	West Penn
218	Hyde Park Foundry & Machine Co.	Hyde Park	West Penn
219	Hutchins Car Roofing Co.	Hyde Park	West Penn
220	American Sheet & Tin Plate Co.	Hyde Park	West Penn
221	American Sheet & Tin Plate Co.	Vandergrift	West Penn
222	United Engineering & Foundry Co. (Chilled Roll Foundry).	Vandergrift	West Penn
223	Pittsburgh Water Heater Co.	Carnegie	P. C. C. & St. L.
224	H. L. Dixon Co.	Carnegie	P. C. C. & St. L.
225	McClintic-Marshall Construction Co.	Carnegie	P. C. & Y.
226	Columbia Steel & Shafting Co.	Carnegie	P. C. & Y.
227	Carbon Steel Co. (Carnegie Plant).	Carnegie	P. C. & Y.
228	Carnegie Plow Mfg. Co.	Carnegie	P. C. & Y.
229	H. Adler Co.	Carnegie	P. C. C. & St. L.
230	John Dunlap Co.	Carnegie	P. C. C. & St. L.
231	Superior Steel Co.	Carnegie	P. C. C. & St. L.
232	Koehler-Streng Co.	Carnegie	P. C. C. & St. L.
233	Flannery Bolt Co.	Bridgeville	P. C. C. & St. L.
234	American Vanadium Co.	Bridgeville	P. C. C. & St. L.
235	U. S. Rolling Mill Co.	Bridgeville	P. C. C. & St. L.

Alphabetical List of Works with Railroad Connections

Name	Location	Railroads	Index No.
Acheson Mfg. Co.	Rankin	P. & L. E.—B. & O.	87
Adler, H., Co.	Carnegie	P. C. C. & St. L.	229
Air Tight Steel Tank Co.	Glenwood	B. & O.	72
Albree, C. B., Iron Works	N. S. Pittsburgh	P. F. W. & C.	39
Allegheny Steel & Iron Co.	Brackenridge	West Penn	213
American Axe & Tool Co.	Glassport	P. & L. E.	113
American Bridge Co.			
Ambridge Plant.	Ambridge	P. F. W. & C.	7
Shiffler Plant.	Pittsburgh	A. V.	175
American Foundry & Construction Co.	Hazelwood	B. & O.	70
American Locomotive Co.	N. S. Pittsburgh	P. F. W. & C.—B. & O.	35
American Nut & Bolt Fastener Co.	N. S. Pittsburgh	P. F. W. & C.—B. & O.	28
American Sheet & Tin Plate Co.			
Hyde Park Works.	Hyde Park	West Penn	220
Leechburg Works.	Leechburg	West Penn	217

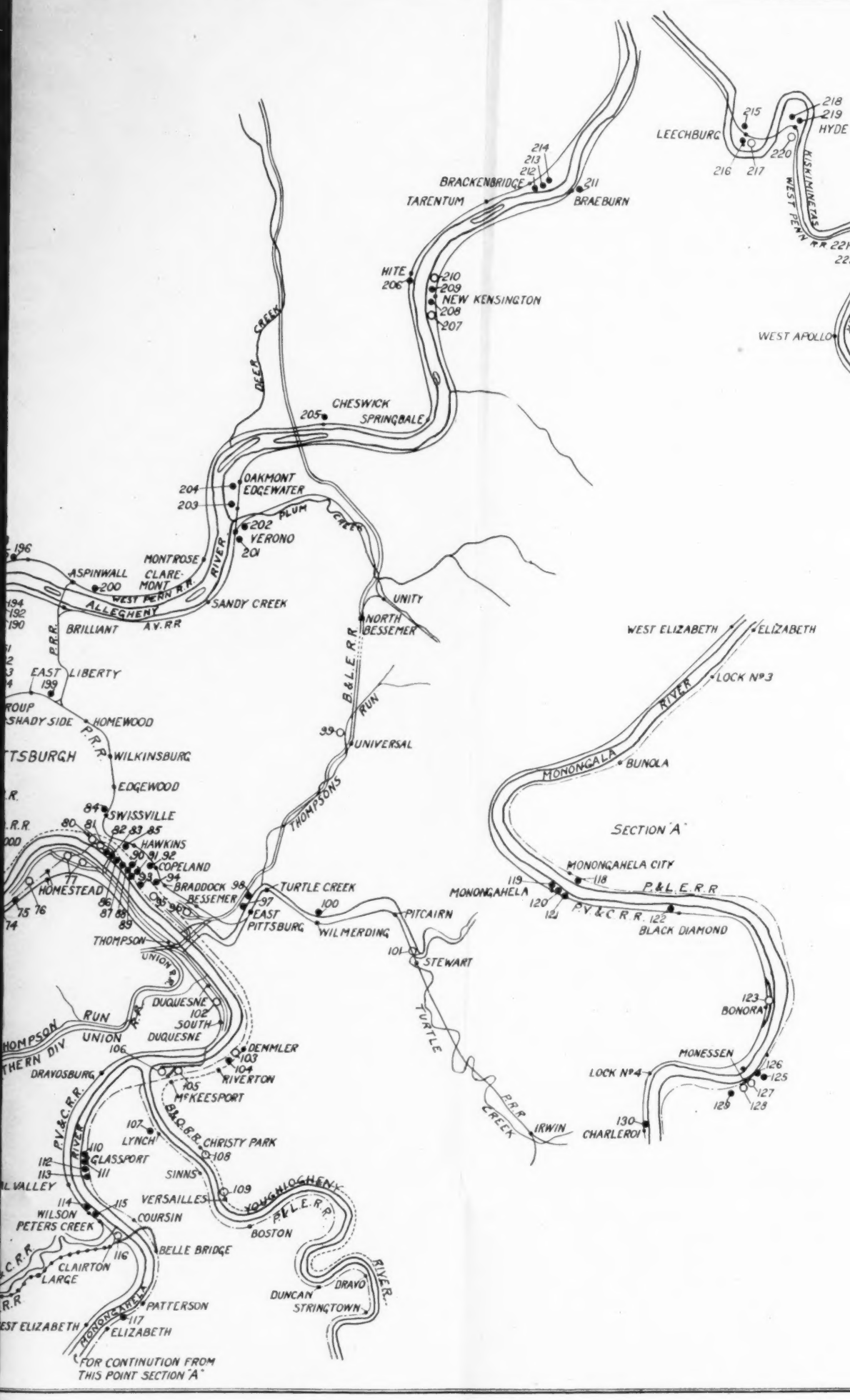
	Location	Railroads
	Pittsburgh	B. & O.
	Pittsburgh	B. & O.
	Pittsburgh	A. V.
Mills).	Pittsburgh	A. V.—B. & O.
	Pittsburgh	A. V.
orks).	Pittsburgh	A. V.
	Pittsburgh	A. V.—B. & O.
	Pittsburgh	A. V.—B. & O.
	Pittsburgh	A. V.
	Pittsburgh	A. V.
	Pittsburgh	A. V.
	Pittsburgh	A. V.
).	Pittsburgh	A. V.
Plant).	Pittsburgh	A. V.
ent Wks.).	Pittsburgh	A. V.
	Pittsburgh	A. V.
s).	Pittsburgh	A. V.
	Pittsburgh	A. V.
	Pittsburgh	A. V.
(F. Knee-		
	Pittsburgh	A. V.
Plant).	Pittsburgh	A. V.
ces).	Etna	West Penn—B. & O.
	Sharpsburg	B. & O.
	Sharpsburg	B. & O.
	Etna	West Penn—B. & O.
	Pittsburgh	A. V.
(Lincoln		
	Pittsburgh	A. V.
	Pittsburgh	A. V.
	Pittsburgh	A. V.
	Pittsburgh	A. V.
	Pittsburgh	A. V.
	Sharpsburg	West Penn
	Sharpsburg	West Penn
	Shadyside	P. R. R.
	Shadyside	P. R. R.
	East Liberty	P. R. R.
	Aspinwall	West Penn
	Verona	A. V.
	Verona	A. V.
	Oakmont	A. V.
	Oakmont	A. V.
	Cheswick	West Penn
Pittsburgh	Hite	West Penn
	New Kensington	A. V.
	New Kensington	A. V.
	New Kensington	A. V.
na Wks.).	New Kensington	A. V.

Name
Monongahela
Monongahela
National W
Pennsylvania
Pittsburgh
U. S. Wor
Vandergrift
Wood Work
American Steel F
American Steel &
Braddock
Rankin Pla
Shoenberger
American Vanadi
Baird Machine C
Baker, J. H., M
Bell Bros.
Best Mfg. Co.
Bindley Hardware
Black Diamond
Bollinger, G. L.,
Braeburn Steel
Braddock Machin
Brown & Co., I
Byers, A. M., &
Carbon Steel Co.
Carbon Steel Co.
Carnegie Steel C
Allegheny
Carrie Fur
Clark Wor
Duquesne
Edgar Tho
Howard A
Homestead
Isabella F
Lower Un
Lucy Furn
Monessen
McCutcheo
Neville Fu
Painter W
Schoen Ste
Warehouse
Upper Un
Carnegie Plow
Carlin Machine
Carlin's, Thos.,
Central Car Wh
Central Foundry

ailroad Terminals and

ack Connections, 191

ATIONAL TUBE CO., PITTSBURGH)



Railroads	Location
Braeburn	A. V.
Brackenridge	West Penn
Brackenridge	West Penn
Brackenridge	West Penn
Leechburg	West Penn
Leechburg	West Penn
Leechburg	West Penn
Hyde Park	West Penn
Hyde Park	West Penn
Hyde Park	West Penn
Vandergrift	West Penn
lled	
Vandergrift	West Penn
Carnegie	P. C. C. & St. L.
Carnegie	P. C. C. & St. L.
Carnegie	P. C. & Y.
Carnegie	P. C. & Y.
Carnegie	P. C. & Y.
Carnegie	P. C. & Y.
Carnegie	P. C. C. & St. L.
Carnegie	P. C. C. & St. L.
Carnegie	P. C. C. & St. L.
Carnegie	P. C. C. & St. L.
Bridgeville	P. C. C. & St. L.
Bridgeville	P. C. C. & St. L.
Bridgeville	P. C. C. & St. L.

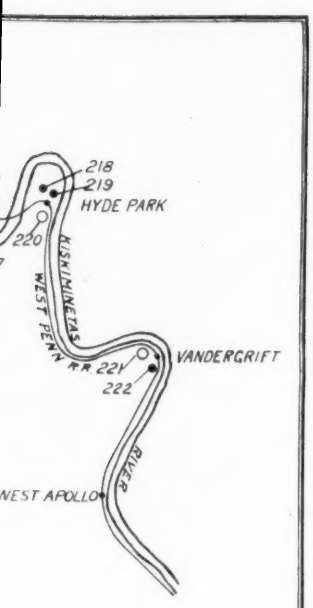
t of Works with onnections

Location	Railroads	Index No.
Rankin	P. & L. E.—B. & O.	87
Carnegie	P. C. C. & St. L.	229
Glenwood	B. & O.	72
N. S. Pittsburgh	P. F. W. & C.	39
Brackenridge	West Penn	213
Glassport	P. & L. E.	113
Ambridge	P. F. W. & C.	7
Pittsburgh	A. V.	175
Hazelwood	B. & O.	70
N. S. Pittsburgh	P. F. W. & C.—B. & O.	35
N. S. Pittsburgh	P. F. W. & C.—B. & O.	28
Hyde Park	West Penn	220
Leechburg	West Penn	217

Name	Location	Railroad
Monongahela Works (Black Plate).	S. S. Pittsburgh	A. & S. S.
Monongahela Works (Tin Plate).	S. S. Pittsburgh	A. & S. S.
National Works.	Monessen	P. & L. E.
Pennsylvania Works.	New Kensington	A. V.
Pittsburgh Works.	New Kensington	A. V.
U. S. Works.	Demmler	P. & L. E.
Vandergrift Works.	Vandergrift	West Penn
Wood Works.	McKeesport	McK. Co
American Steel Foundries	Pittsburgh	A. V.
American Steel & Wire Co.		
Braddock Plant.	Braddock	P. & L. E.
Rankin Plant.	Rankin	P. & L. E. —Union
Shoenberger Plant.	Pittsburgh	A. V.—B.
American Vanadium Co.	Bridgeville	P. C. C.&
Baird Machine Co.	Pittsburgh	A. V.
Baker, J. H., Mfg. Co.	Brackenridge	West Penn
Bell Bros.	Pittsburgh	A. V.
Best Mfg. Co.	Oakmont	A. V.
Bindley Hardware Co.	Shadyside	P. R. R.
Black Diamond Engineering Co.	Black Diamond	P. V. & C.
Bollinger, G. L., & Co.	Verona	A. V.
Braeburn Steel Co.	Braeburn	A. V.
Braddock Machine & Mfg. Co.	Braddock	P. & L. E.
Brown & Co., Inc.	Pittsburgh	P. F. W. &
Byers, A. M., & Co.	S. S. Pittsburgh	A. & S. S.
Carbon Steel Co.	Pittsburgh	A. V.—B.
Carbon Steel Co.	Carnegie	
Carnegie Steel Co.		
Allegheny Furnace.	N. S. Pittsburgh	P. F. W. &
Carrie Furnace.	Rankin	Union
Clark Works.	Pittsburgh	A. V.—B.
Duquesne Works.	South Duquesne	Union
Edgar Thomson Works.	Bessemer	Union
Howard Axle Works.	Homestead	Union
Homestead Works.	Munhall	Union
Isabella Furnaces.	Etna	West Penn
Lower Union Mills.	Pittsburgh	A. V.—B.
Lucy Furnaces.	Pittsburgh	A. V.
Monessen Works.	Monessen	P. & L. E.
McCutcheon Works.	N. S. Pittsburgh	B. & O.
Neville Furnace.	Neville Island	P. C. & Y.
Painter Works.	S. S. Pittsburgh	P. & L. E.
Schoen Steel Wheel Co.	McKees Rocks	P. C. & Y.
Warehouse.	Pittsburgh	B. & O.
Upper Union Mills.	Pittsburgh	A. V.—B.
Carnegie Plow Mfg. Co.	Carnegie	P. C. & Y.
Carlin Machine & Supply Co.	N. S. Pittsburgh	B. & O.
Carlin's, Thos., Sons Co.	N. S. Pittsburgh	West Penn
Central Car Wheel Co.	McKees Rocks	P. C. & Y.
Central Foundry Co.	Pittsburgh	A. V.

nd location of Iron and

912



Railroads	Index No.
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McK. Conn.	106
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P. & L. E.	95
P. & L. E.—B. & O. —Union	81
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A. V.	144
West Penn	212
A. V.	147
A. V.	203
P. R. R.	198
P. V. & C.	122
A. V.	202
A. V.	211
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Union	96
Union	76
Union	77
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A. V.	180
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P. C. & Y.	228
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West Penn—B. & O.	154
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A. V.	142

Name	Location	Railroads	Index No.
Clark Safe & Vault Co.			117
Clairton Steel Co.	Van Kirk	P. & L. E.	116
Clinton Iron & Steel Co.	Clairton	Si. C. T.	
	S. S. Pittsburgh	P. & L. E. —P. C. C. & St. L.	51
Columbia Steel & Shafting Co.			83
Rankin Works	Rankin	P. & L. E.	
Carnegie Works.	Carnegie	P. C. & Y.	226
Consolidated Expanded Metal Co., Inc.	Rankin	P. & L. E.—B. & O.	86
Crucible Steel Co.			1
Aliquippa Works.	Aliquippa	P. & L. E.	
Crescent Works.	Pittsburgh	A. V.	177
LaBelle Works.	N. S. Pittsburgh	B. & O.	42
Park Works.	Pittsburgh	A. V.—B. & O.	158
Singer Works.	S. S. Pittsburgh	P. & L. E.	48
Damascus Bronze Co.	N. S. Pittsburgh	B. & O.	45
Dilworth Porter & Co.	S. S. Pittsburgh	A. & S. S.	53
Duff Mfg. Co.	N. S. Pittsburgh	P. F. W. & C.	44
Duquesne Steel Foundry Co.			10
Dixon, H. L., Co.	Coraopolis	P. & L. E.	224
Dunlap, John, Co.	Carnegie	P. C. C. & St. L.	230
Eichleay, John, Jr., Co.	Carnegie	P. C. C. & St. L.	59
Enameled Metals Co.	S. S. Pittsburgh	A. & S. S.	187
Enterprise Foundry Co.	Sharpsburg	B. & O.	36
Epping-Carpenter Co.	N. S. Pittsburgh	P. F. W. & C.	171
Etna Forge & Bolt Co.	Pittsburgh	A. V.	186
Fairbanks Co.	Sharpsburg	B. & O.	155
Ferguson, T. P., Co.	Pittsburgh	P. R. R.	199
Firth-Sterling Steel Co.	East Liberty	P. R. R.	104
	Demmler	P. & L. E.—B. & O.	
Flannery Bolt Co.	Bridgeville	P. C. C. & St. L.	233
Follansbee Bros. Co.	Pittsburgh	P. R. R.	131
Fort Pitt Malleable Iron Co.	McKees Rocks	P. C. & Y.	21
Fort Pitt Spring & Mfg. Co.	McKees Rocks	P. C. & Y.	19
Garrison Foundry Co.	S. S. Pittsburgh	A. & S. S.	55
Graham Nut Co.	Neville Island	P. C. & Y.	13
Griswold Wire Co.	Braddock	P. & L. E.	91
Hall Steam Pump Co.	N. S. Pittsburgh	B. & O.	46
Heppenstall Forge & Knife Co.	Pittsburgh	A. V.	174
Heyl & Patterson	N. S. Pittsburgh	B. & O.	38
Hubbard & Co.	Pittsburgh	A. V.	194
Hussey Binns Shovel Co.	Charleroi	P. V. & C.	130
Hutchins Car Roofing Co.	Hyde Park	West Penn	219
Hyde Park Foundry & Machine Co.	Hyde Park	West Penn	218
Independent Bridge Co.	N. S. Pittsburgh	B. & O.	41
Interstate Steel Co.	Brackenridge	West Penn	214
Iron City Tool Co.	Pittsburgh	A. V.	161
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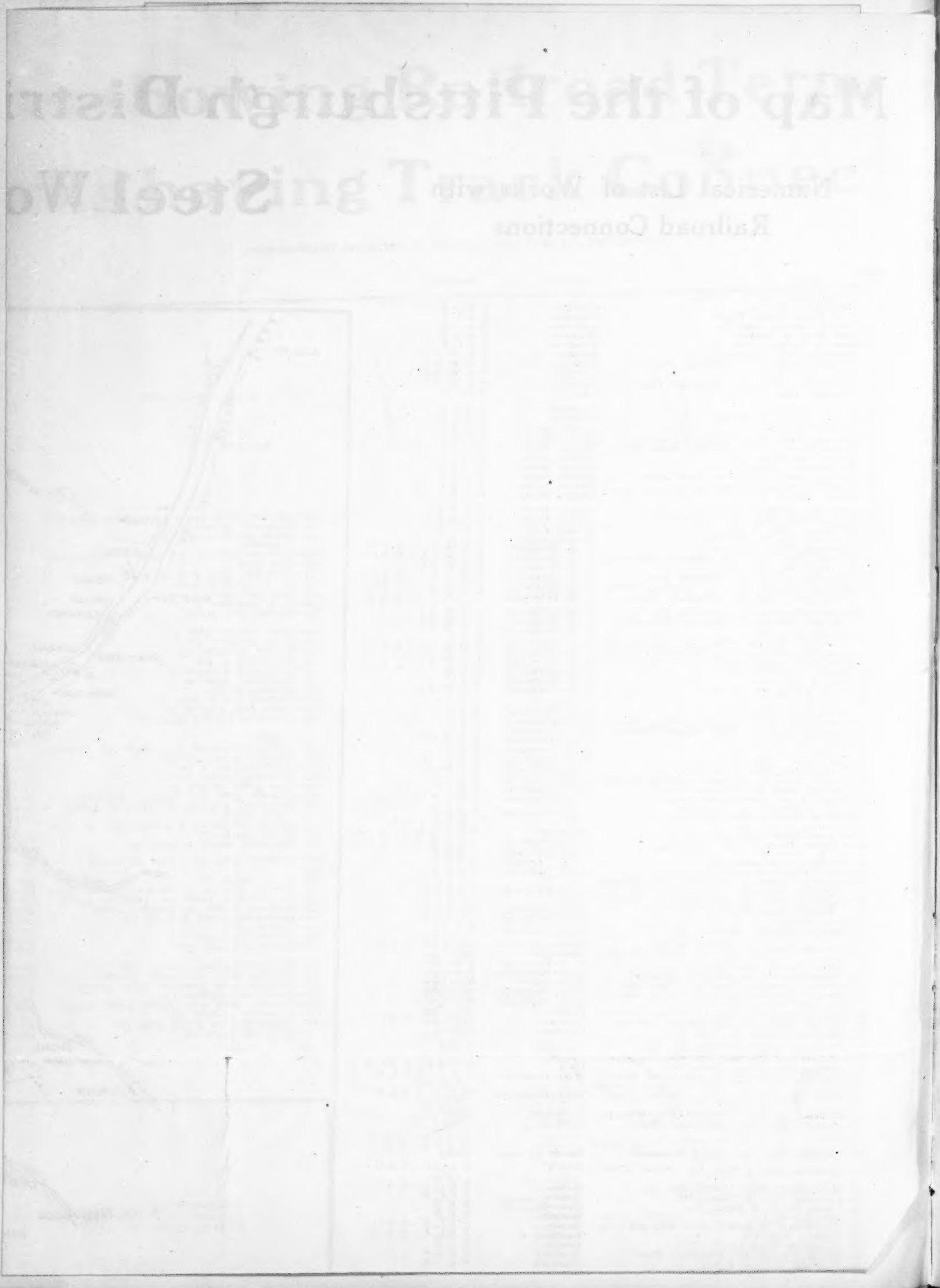
Machine Shop.	S. S. Pittsburgh	P. V. & C.	60
Soho Furnaces.	Pittsburgh	Mon. Con.	62
Soho Dept.	Pittsburgh	Mon. Con.	65
South Side Dept.	S. S. Pittsburgh	Mon. Con.	66
Koehler-Streng Co.	Carnegie	P. C. C. & St. L.	232
Kidd Bros. & Burgher	Aliquippa	P. & L. E.	4
Lanz, M., & Son	S. S. Pittsburgh	Mon. Con.	67
Lawrence Iron & Steel Co.	Pittsburgh	A. V.	160
Liggett Spring & Axle Co.	Monongahela City	P. & L. E.	118
Lewis Foundry & Machine Co.	Groveton	P. & L. E.	12
Lockhart Iron & Steel Co.	McKees Rocks	P. C. & Y.	24
Mackintosh, Hemphill & Co.	Pittsburgh	P. F. W. & C.—B. & O.	136
Maloney, T. J.	Pittsburgh	A. V.	146
Marshall Foundry Co.	Pittsburgh	A. V.—B. & O.	150
Mesta Machine Co.	West Homestead	B. & O.—P. V. & C. —P. & L. E.	75
Monessen Foundry & Machine Co.	Monessen	P. & L. E.	125
Monroe, H. & Son	Pittsburgh	A. V.	145
Monongahela Iron & Steel Co.	Hays	P. V. & C.—P. & L. E.	73
Monongahela Tube Co.	Wilson	P. V. & C.	115
Monongahela Foundry & Forge Co.	Monongahela City	P. V. & C.	119
Monongahela Mfg. Co.	Monongahela City	P. V. & C.	120
Moorehead Bros. & Co.	Sharpsburg	West Penn	195
Morris & Bailey Steel Co.	Wilson	P. V. & C.	114
McCance Bros. Co., Inc.	Pittsburgh	A. V.	189
McClintic-Marshall Construction Co.			
Carnegie Works.	Carnegie	P. C. & Y.	225
Rankin Works.	Rankin	P. & L. E.—B. & O.	82
McConway & Torley Co.			
48th St. Works.	Pittsburgh	A. V.	176
56th St. Works.	Pittsburgh	A. V.	184
McCullough-Dalzell Crucible Co.	Pittsburgh	A. V.—B. & O.	170
McKay, James & Co.	McKees Rocks	P. C. & Y.	20
McKeesport Tin Plate Co.	Lynch Station	P. & L. E.	107
McNeil & Bros. Co.	Pittsburgh	P. R. R.—B. & O.	156
McVay & Walker	Braddock	P. & L. E.	94
National Car Wheel Co.	West Homestead	B. & O.—P. & L. E. —P. V. & C.	74
National Nut & Bolt Co.	Pittsburgh	A. V.	193
National Supply Co.	Pittsburgh	A. V.	141
National Tube Co.			
Christy Park Works.	Christy Park	B. & O.	108
Continental Works.	Pittsburgh	Mon. Con.—B. & O.	69
National Works.	McKeesport	McK. Con.	105
National Galvanizing Works.	Versailles	B. & O.	109
Pennsylvania Works.	Pittsburgh	Mon. Con.—B. & O.	61
Republic Works.	S. S. Pittsburgh	P. & L. E.	64
Neely Nut & Bolt Co.	S. S. Pittsburgh	P. & L. E.	63
Nuttall, R. D., & Co.	Pittsburgh	A. V.	182
Nicholson & Co.	Hawkins	P. R. R.	85
Oil Well Supply Co.	Pittsburgh	A. V.—B. & O.	139
Oliver Iron & Steel Co.	S. S. Pittsburgh	A. & S. S.	56
Page Woven Wire Fence Co.	Monessen	P. & L. E.	126
Pennsylvania Malleable Co.	McKees Rocks	P. C. & Y.	17
Pennsylvania Casting & Machine Co.	N. S. Pittsburgh	P. F. W. & C.	31
Pennsylvania Drop Forging Co.	Pittsburgh	P. F. W. & C.—B. & O.	132
Pittsburgh Conduit Co.	Pittsburgh	A. V.	165
Pittsburgh Cold Rolled Steel Co.	Pittsburgh	B. & O.	164
Pittsburgh Crushed Steel Co.	Pittsburgh	A. V.	191
Pittsburgh Forge & Iron Co.	N. S. Pittsburgh	P. F. W. & C.—B. & O.	25
Pittsburgh Gage & Supply Co.	Pittsburgh	B. & O.	157
Pittsburgh Galvanizing Co.	Pittsburgh	A. V.—B. & O.	140
Pittsburgh Foundry & Machine Co.	Pittsburgh	B. & O.	162
Pittsburgh Machine Tool Co.	Copeland	P. R. R.	92
Pittsburgh Malleable Co.	Pittsburgh	A. V.	167
Pittsburgh Pipe & Iron Co.	McKees Rocks	P. & L. E.	23
Pittsburgh Reduction Co.	New Kensington	A. V.	209
Pittsburgh Rivet Co.	Pittsburgh	B. & O.	163
Pittsburgh Steel Construction Co.	Economy	P. F. W. & C.	6
Pittsburgh Steel Co.			
Glassport Works.	Glassport	P. & L. E.	111
Monessen Works.	Monessen	P. & L. E.	129
Pittsburgh Steel Foundry	Glassport	P. & L. E.	112
Pittsburgh Spring & Steel Co.	Pittsburgh	A. V.	181
Pittsburgh Shovel Co.	Leechburg	West Penn	216
Pittsburgh Stove & Range Co.	N. S. Pittsburgh	B. & O.	34
Pittsburgh Smelting & Refining Co.	Glenwood	B. & O.	71
Pittsburgh Tool & Drop Forge Co.	Cheswick	West Penn	205
Pittsburgh Valve Foundry & Construction Co.			
Machine Shop.	Pittsburgh	A. V.—B. & O.	143
Pipe Shop.	Pittsburgh	A. V.—B. & O.	149
Pittsburgh Water Heater Co.	Carnegie	P. C. C. & St. L.	223
Porter, H. K., Co.	Pittsburgh	A. V.	178
Pressed Steel Car Co.			
McKees Rocks Plant.	McKees Rocks	P. C. & Y.	15
Allegheny Plant.	N. S. Pittsburgh	P. F. W. & C.—B. & O.	26
Reliance Steel Casting Co.	Pittsburgh	A. V.	148
Richardson & Co.	Shadyside	P. R. R.	197
Riter-Conley Mfg. Co.			
Allegheny Plant.	N. S. Pittsburgh	P. F. W. & C.—B. & O.	30
Leetsdale Plant.	Leetsdale	P. F. W. & C.	9
Robison Machine Co.	Monongahela City	P. V. & C.	121
Rosedale Foundry Co.	N. S. Pittsburgh	P. F. W. & C.—B. & O.	37
Russel, J. G., Shovel Works	Aliquippa	P. & L. E.	2
Russell Machinery Co.	Pittsburgh	A. V.	151-153
Scaife, W. B., & Sons Co.	Oakmont	A. V.	204
Severance Mfg. Co.	Glassport	P. & L. E.	110
Seaman-Sleeth Co.	Pittsburgh	A. V.	172
Sharpsburg Foundry Co.	Sharpsburg	West Penn	196
Spang-Chalfant & Co.	Etna	West Penn	188
Standard Chain Co.	Braddock	P. & L. E.	89
Standard Sanitary Mfg. Co.	N. S. Pittsburgh	P. F. W. & C.—B. & O.	29
Sterling Steel Foundry Co.	Braddock	P. & L. E.	93
Superior Mfg. Co.	N. S. Pittsburgh	P. F. W. & C.	33
Superior Steel Co.	Carnegie	P. C. C. & St. L.R. R.	231
Tate-Jones Co.	Leetsdale	P. F. W. & C.	8
Taylor-Wilson Mfg. Co.	McKees Rocks	P. C. & Y.	22
Tyler, W. S., Co.	Coraopolis	P. & L. E.	11
Union Foundry & Machine Co.	S. S. Pittsburgh	P. & L. E.	50
United Engineering & Foundry Co.			
Chilled Roll Foundry.	Vandergrift	West Penn	222
F. Kneeland Dept.	Pittsburgh	A. V.	183
Lincoln Dept.	Pittsburgh	A. V.	190
Union Steel Co.	Donora	P. V. & C.	123
Union Steel Casting Co.	Pittsburgh	A. V.	192
Union Spring & Mfg. Co.	New Kensington	A. V.	208
Union Switch & Signal Co.	Swissvale	P. R. R.	84
Universal Portland Cement Co.	Universal	P. & L. E.	99
U. S. Rolling Mill Co.	Bridgeville	P. C. C. & St. L.	235
Vanadium Mines Co.	Rankin	B. & O.	88
Verona Tool Works	Verona	A. V.	201
Vulcan Crucible Steel Co.	Aliquippa	P. & L. E.	3
Westinghouse Electric & Mfg. Co.			
Allegheny Works.	N. S. Pittsburgh	P. F. W. & C.	47
East Pittsburgh Works.	East Pittsburgh	P. R. R.	98
Westinghouse Air Brake Co.	Wilmerding	P. R. R.	100
Westinghouse Machine Co.	East Pittsburgh	P. R. R.	97
Wall, P., Mfg. Co.	N. S. Pittsburgh	P. F. W. & C.	27
Wilson-Snyder Mfg. Co.	Pittsburgh	P. C. C. & St. L.	52
Wickes Bros.	Pittsburgh	A. V.	173
Westinghouse Foundry Co.	Stewart	P. R. R.	101
West Leechburg Sheet & Tin Plate Co.	Leechburg	West Penn	215
Yost Bros.	Hite	West Penn	206
Zug Iron & Steel Co.	Pittsburgh	P. F. W. & C.—B. & O.	137



The Use of Anti-Piping Thermit in Steel Ingots

Results of a Series of Experiments On Treated and Untreated Ingots to Ascertain the Effects of Thermit On Steel

By C Canaris

Anti-piping thermit is used to improve the quality of steel ingots by reducing the following defects:

1—Shrink holes and piping.
2—Injurious segregation in the top of the ingot.
3—Large blow-holes.

Furthermore, the number of the small blow-holes is reduced and the resulting material is much denser.

The anti-piping thermit process is based on several patents owned by Th. Goldschmidt, Essen, Germany. The material used as anti-piping thermit in steel ingots consists principally of a mixture of metallic aluminum and iron oxide, in equivalent parts. If this mixture is raised to a temperature of over 1,200 degrees Cent., the iron oxide is reduced by the aluminum to the following equation:

$$3\ FeO\ 2\ Al\ 3\ Fe\ Al_2O_3.$$

During this reaction a large amount of heat is generated which raises the products of the reaction to about 3,900 degrees Cent. (5,400 degrees Fahr.) The anti-piping thermit is applied in sheet iron cans supported by a thin iron rod which is inserted in the hole in the can and the thermit can is introduced into the molten metal at the point where the reaction is to take place.

Experiments With Anti-Piping Thermit

During the last few years, many experiments with the anti-piping thermit have been made at different plants, but to the best of my knowledge these were only tried on silicon-treated material, especially forging steel, and never on material not treated with silicon. The purpose of these experiments was to decrease the piping by introducing the thermit cans into the heads of the ingots directly after pouring, allowing the reaction to take place there. It was thought that through the absorption of the heat produced during the reaction, the heads of these ingots would be kept hot and the piping thus reduced. A. Obholzer published detailed reports regarding these experiments in *Stahl und Eisen,* July 31 and Aug. 7, 1907. From these reports it seems that the improvement caused by the application of the anti-piping thermit for heating the heads of the ingots was very small and not in proportion to the expense involved. The explanation for this is, that the heat produced by the thermit reaction was altogether too small to increase the temperature of the ingot heads effectively and that extraordinarily large quantities of thermit would be necessary to produce sufficient heat.

Thermit in Silicon-Treated Steel

The methods were, therefore, changed, and the thermit can was introduced at a fixed time after the ingot had been filled. The can was pushed down as far as possible in the mold, preferably clear to the bottom so that the reaction might take place at the lowest possible point. In this way a strong mechanical effect is exercised on liquid metal in the interior of the ingot. Special additions to the anti-piping thermit are made for the purpose of decreasing the melting point of the slag, and thus entirely preventing particles of slag from remaining in the body of the ingots. This improved process was applied only to silicon-treated material and good results were achieved in several steel works. Encouraged by these results it was decided to use the anti-piping thermit in steel ingots designed for the manufacture of plates not treated with silicon.

As the results obtained were favorable from the beginning, a systematic development of the process was carried out. On the basis of a large number of experiments made with ingots, weighing one ton and upwards, the quantity of thermit sufficient for each weight of ingot was accurately determined. It was then found experimentally at what time, after pouring the ingot, the thermit should be introduced, and when more metal should be added in order to obtain the most favorable results. From these experiments, the following directions for this process can be outlined.

Directions for Use of Thermit

The pouring of the ingots is accomplished in the usual way, either by direct-pouring from the top or by the more complicated bottom-pouring method, where ingots are poured in groups; in the latter case the additional metal is, of course, added from the top. The filled molds are allowed to remain until the solidification has so far advanced that on the walls of the mold a crust of considerable thickness is formed. The thickness of the crust depends, of course, principally on the size of the ingots to be made. Then the anti-piping can is pushed to the very bottom of the mold and is held there until the thermit reaction has taken place. The reaction sets up a sudden and strong seething motion in the steel. After the reaction ceases, the surface of the still liquid material sinks, according to its condition, from 3 to 6 inches, while the solidified walls remain intact. Then enough hot metal is quickly added, by direct pouring from the ladle to bring the surface of the still liquid interior of the ingot to the same level as the solidified walls. The molds are then immediately covered and the ingots left to cool.

Effect of Anti-Piping Thermit

The products of the thermit reaction, which are formed in the lower part of the ingot, namely thermit iron and slag, have a much higher temperature and are considerably lighter than the surrounding steel; therefore, they are both thrown with great force towards the top. This accounts for the boiling and seething of the steel in the mold. It is evident that this boiling has a favorable effect. It serves to mix thoroughly the entire fluid material and the iron at the top, which has been cooled considerably by radiation, is replaced by hot metal from the interior of the ingot. This has a tendency to prevent the formation of piping and is made still more effective by the large amount of new metal added. By this operation the reduction of volume caused through shrinkage and the removal of gases is compensated to such a degree, that very often the excess material is pressed towards the top with sufficient force to lift the cover. The formation of a pipe is, therefore, impossible. Furthermore, a large amount of gas is liberated, as it is not necessary to cover the ingots prematurely, a practice generally followed in ordinary ingot casting. A further removal of the gases is accom-

plished by the strong boiling of the material caused by the thermit reaction.

When anti-piping thermit is not used, it is probable that large and small gas bubbles will be caught in the ingot as the metal becomes pasty, thus causing blow-holes and porous metal. With the anti-piping thermit reaction, however, all gases are thrown to the top. Furthermore, any segregated and deleterious elements in the steel are likewise thrown to the top where they can do no harm.

These reactions are favored by the fact, that the escape of gas is not prematurely interrupted by the covering of the mold, and by the addition of a quantity of fresh metal, the head of the ingot stays hot for a considerable length of time. Plates rolled from thermit-treated ingots can be used practically in their entirety and only small parts of the top and bottom of the sheets have to be scrapped. As the effect of the anti-piping thermit, if applied properly, is absolutely certain, a higher output can be obtained in plate mills than when using ordinary ingots.

Table I.

RESULTS OBTAINED WITH ANTI-PIPING THERMIT

Remarks.	Plate No.	Weight of ingots lbs.	Width of plate, inches.	Thickness of plate, inches.	Length of lap, inches.
With thermit	1	2827	94.20	28-64	6.29
With thermit	2	2849	84.00	25-64	4.72
With thermit	3	2849	94.20	28-64	4.72
With thermit	4	2838	94.20	28-64	4.72
Without thermit	5	2739	84.60	25-64	30.31

Remarks.	Plate No.	Tensile strength, lbs. per sq. in.	Elongation, per cent.	Place where test was taken.
With thermit	1	52,400	32.0	Base
With thermit		55,100	28.5	Head
With thermit	2	52,100	30.0	Base
With thermit		53,800	28.0	Head
With thermit	3	51,400	32.0	Base
With thermit		54,300	29.5	Head
With thermit	4	51,800	31.0	Base
With thermit		54,200	29.5	Head
Without thermit	5	52,300	28.0	Base
Without thermit		59,600	20.0	Head

Results of Experiments

Herewith are given a few results of the many experiments, which were undertaken to establish the effect of the anti-piping thermit. In the first experiments thermit was applied to improve the quality of metal not treated with silicon. From a heat made on July 12, 1911, two ingots, weighing about 12,800 pounds each were cast. One of the two ingots were treated with thermit. The treated ingot was rolled to a plate, 9 feet, 7 inches wide, ¾ inch thick and 32 feet, 3 inches long. The output amounted to 75 per cent. The test piece taken from the bottom of the plate had a tensile strength of 50,800 pounds per square inch and 31 per cent elongation; the test piece from the top, 53,500 pounds per square inch and 29.5 per cent elongation; the lap at the top of plate was 10 inches. The untreated ingot was rolled to a plate 10 feet, 1 inch wide, 1 5/16 inches thick and 20 feet. 8 inches long. The output was 68 per cent. The test piece from the bottom showed a tensile strength of 50,200 pounds per square inch and 33 per cent elongation, while the tests from the top of the plate showed 54,900 pounds per square inch and 25 per cent elongation. The lap was 24 inches long.

Further results are given in Table I, the ingots having been poured from the bottom in one lot. The analyses, Table II, show the great uniformity of thermit-treated material.

A great many experiments of this kind were made and always with the same results. In no case was extensive piping found and the segregation was comparatively small, although the plates were used with the least possible amount of cropping. These favorable results led to the treatment of a large number of ingots of various weights with the anti-piping thermit in order to obtain a good, average result.

Table II.

ANALYSES AND TENSILE TESTS OF THERMIT PLATES

	Analyses. Head				Base			
	Carbon, per cent.	Manganese, per cent.	Phosphorus, per cent.	Sulphur, per cent.	Carbon, per cent.	Manganese, per cent.	Phosphorus, per cent.	Sulphur, per cent.
Plate No. 1...	0.082	0.40	0.022	0.040	0.078	0.40	0.019	0.038
Plate No. 2...	0.072	0.49	0.048	0.046	0.070	0.48	0.033	0.040
Plate No. 3...	0.076	0.45	0.028	0.020	0.070	0.43	0.026	0.018
Plate No. 4...	0.071	0.47	0.040	0.030	0.069	0.45	0.032	0.026
Plate No. 5...	0.082	0.45	0.028	0.020	0.074	0.43	0.026	0.018

CORRESPONDING TEST PIECES.

	Head		Base	
	Tensile strength lbs. per sq. in.	Elongation, per cent.	Tensile str'gth, lbs. per sq. in.	Elongation, per cent.
Plate No. 1	53,893	28.0	51,476	30.5
Plate No. 2	53,639	29.5	51,476	32.0
Plate No. 3	54,320	27.5	51 192	31.5
Plate No. 4	52,329	28.5	49,912	32.0
Plate No. 5	54,889	26.5	51,334	31.0

Cost of Thermit Treatment

During the period from July 12 to Oct. 31, 1911, 4,409 ingots, weighing from 1 to 8 long tons, were treated with thermit. The cost of this treatment amounted to 35 cents per ton of ingots. All treated ingots were rolled. These ingots were in all cases 3 to 5 per cent lighter than those ordinarily used, for the same size plates. Of the 4,409 ingots rolled to plates only 16 showed any defects, which could be traced to a faulty quality of the material. The total weight of the ingots from which these 16 plates were made amounted to 22½ long tons, while the total weight of the 4,409 ingots was 7,628 long tons. The loss was, therefore, less than 0.3 per cent. The total increase of output was more than 5 per cent of the quantity charged.

If we figure the difference between the price of the plates and the price for the scrap at $14.30 per ton, we will obtain, through the use of thermit ingots for the plate mill, a saving of

$$\frac{7{,}628 \times 5}{100} \times \$14.30 = \$5{,}454,$$

while the steel works only expended $2,681 for thermit. The net gain amounted to $2,769, or about 36 cents per long ton.

Added to this saving are other advantages which cannot be estimated in figures, namely the increase of the production without enlarging the works and the decrease of the resulting scrap. It should be further considered that on account of the almost entire absence of scrap plates, the work in the rolling mill is much more uniform, as there is no delay in the work and in the filling of orders due to cutting and cleaning of scrap plates. The results prove

that the anti-piping thermit process has shown itself to be an extraordinarily simple and effective aid in improving the quality of ingots untreated with silicon. Whether it can also be used for silicon-treated iron and just how it is to be applied in such material, experiments which are now being conducted, will show. Up to the present time only the Harmet process has been used on a large scale for material untreated with silicon.

A Quick Detachable Grab Bucket

The Whiting Foundry Equipment Co., Harvey, Ill., has obtained the exclusive right to manufacture the Watters quick-detachable grab bucket, which can be handled by a crane by merely inserting the crane hook into the yoke to which the operating ropes are attached. Lowering the crane hook sets the latch mechanism and raising the hook closes the blades and grabs the load. The contents are dumped by pulling the hand rope attached to the latch lever which can be controlled by the crane operator or from the floor. In Fig 1 the bucket is shown in open position ready for filling and in Fig. 2 the bucket is closed and contains a load of sand.

All shock, either to the crane or bucket, when emptying the load, is absorbed by a special, cylinder-operating device. The bucket can be operated underneath a minimum of headroom and a new arrangement, which is now being designed, will permit of its operation in even a smaller space than indicated in the accompanying illustrations. When not in use the bucket can be quickly detached, leaving the crane hook free for other service. This bucket will prove of great value in foundries where it can be employed for cleaning floors, cutting sand, filling large molds, transferring sand from shaking-out to molders' floors and for removing refuse. It also can be employed efficiently for loading and unloading coal, coke, clay, crushed stone, gravel, etc. On large jar-ramming molding machine work this bucket can be employed for filling the flasks, thereby eliminating the shoveling of large quantities of sand by hand. Molding operations can be greatly facilitated and the number of laborers usually employed for this work can be greatly reduced. A bucket of two cubic yards capacity operating under actual shop conditions recently unloaded 40 tons of sand from a gondola car in 20 minutes, the only manual labor employed being that of the crane operator. This bucket is built in three sizes in 1, 1½ and 2-cubic yard capacities.

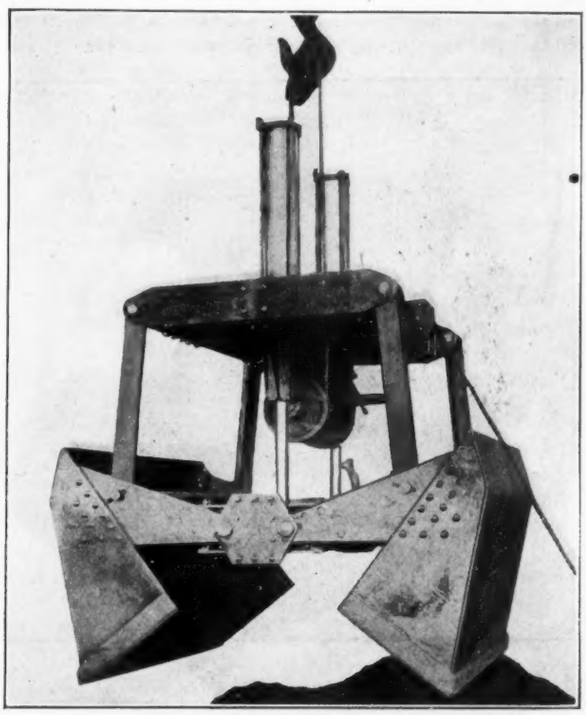


FIG. 1—QUICK-DETACHABLE GRAB BUCKET IN OPEN POSITION

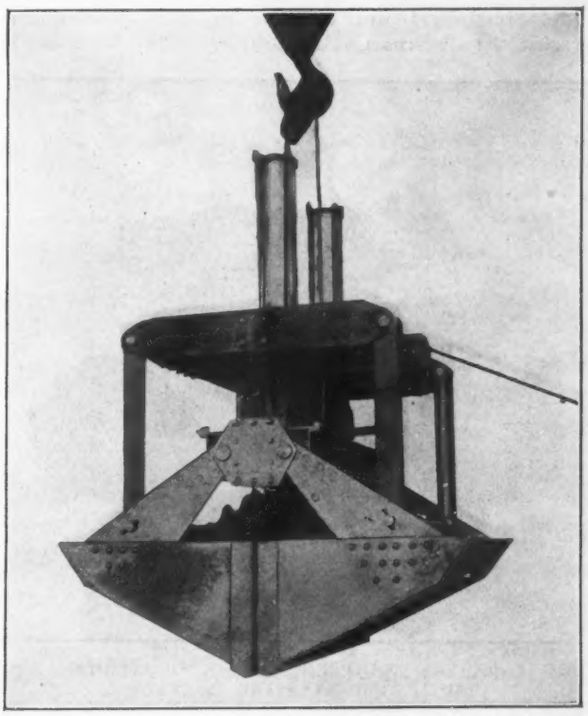


FIG. 2—QUICK-DETACHABLE GRAB BUCKET IN CLOSED POSITION

It is reported that the Maxwell-Briscoe Motor Co., New Castle, Ind., has ordered plans for the construction of an addition to its factory and that it will purchase $200,000 worth of new machinery.

Bucyrus Co. Will Build Atlantic Type Shovel

The Bucyrus Co., South Milwaukee, Wis., has taken over the manufacture of the Atlantic type shovel, heretofore built by the American Locomotive Co., New York City, but will continue building its present line of chain type shovels and, in addition, will eventually build a complete line of Atlantic wire rope shovels. The manufacture of the Vulcan shovel has been transferred by the Bucyrus Co. from Toledo, O., to its new plant at Evansville, Ind. A stock of repair parts for all shovels will be carried at Montreal, New York, San Francisco and Spokane, in addition to the stock of parts at the South Milwaukee and Evansville plants.

Numerous changes in the sales organization of the Bucyrus Co. have been made. Carl Horix, formerly general manager of the Vulcan Steam Shovel Co., Toledo, has been placed in charge of the Chicago office of the Bucyrus Co. in the capacity of central sales manager. With him are associated E. L. Bryon, formerly eastern sales manager of the Vulcan company, and W. S. Russel and B. F. Johnston, both formerly connected with the Vulcan company. Offices have been established at 622 McCormick building. Carl S. Reed, formerly western sales manager of the American Locomotive Co., has been appointed eastern sales

manager of the Bucyrus Co., with offices at 50 Church street, New York city. With him are associated J. N. Gawthrop and Edward G. Lewis. A Duluth office also has been established, which is in charge of E. C. Hingston. Mussens, Ltd., Montreal, Can., retain the Canadian agency and Norman B. Livermore & Co., San Francisco, will handle steam shovels, wrecking cranes pile drivers and ballast plows in California and the same products, with the addition of drag line excavators, in Nevada, Utah and Arizona. The Stuart A. Taylor Co. has the agency for all of the Bucyrus products with the exception of dredges in Washington, Oregon and Idaho. The Yuba Construction Co., San Francisco, will handle dredges on the Pacific coast, Alaska and the Yukon. H. N. Steinbarger will continue to represent the Bucyrus Co., at Denver, and Mexico will be covered by Smith & Wiggin, of Mexico City. Geo. B. Massey, for a number of years in charge of the New York office, is now located at the general office in South Milwaukee and is preparing for an extensive trip abroad in the interest of the company's foreign business.

The Detroit Seamless Steel Tubes Co., Detroit, advises that a contract has been let for replacement of its plant damaged by fire. The new building will be considerably higher than the old one, and will be of modern steel construction. There will be but little equipment required. The fire, which occurred Feb. 15, caused a delay of 10 days in the company's production department.

Automatic Starting Control for Crank Shapers

In Figs. 1 and 2 is illustrated a 24-inch Gould & Eberhardt crank shaper, driven by a five-horsepower, adjustable speed motor of the armature shifting type, with a speed range of 300 to 1,500 revolutions per minute. The shaper is equipped with an automatic starting control and speed dial, furnished by the Reliance Electric & Engineering Co., Cleveland. Speed adjustments of the motor are obtained by the mechanical shifting of the motor armature. This is controlled by the hand wheel, *A*, Figs. 1 and 2. By using a motor with a speed range equal to the ratio of the back gear, an unbroken range of cutting strokes is obtained, from 4½ to 115. The unlimited number of cutting strokes throughout this wide range, combined with the ample power at all speeds, insures a maximum output for any size cut or any kind of material.

The starting and stopping of the motor are controlled by an automatic starter through the drum switch, *B*. This switch has three points, namely, start, off and brake. To start the motor, it is merely necessary for the operator to throw the switch to the starting position. When the switch is thrown to the off position, the power is shut-off. When the switch is thrown to the brake position, the motor automatically is brought to a stop almost instantly. This simple and positive method of stopping eliminates the necessity of installing a clutch. The starter is of the series control type and automatically takes care of all starting conditions. All wires are carried in a conduit tapped directly into the drum switch, thereby eliminating exposed wire and contacts on the machine.

The speed dial shown at *C*, has previously been described in THE IRON TRADE REVIEW and is intended for use with the Reliance adjustable speed motor so as to permit of instantly setting the speed of a motor to obtain any desired speed at the cutting tool. This device is in the form of a circular slide rule and in the case of a shaper takes into account all of the variable factors, such as ratio of the drive, length of stroke and the cutting speed desired.

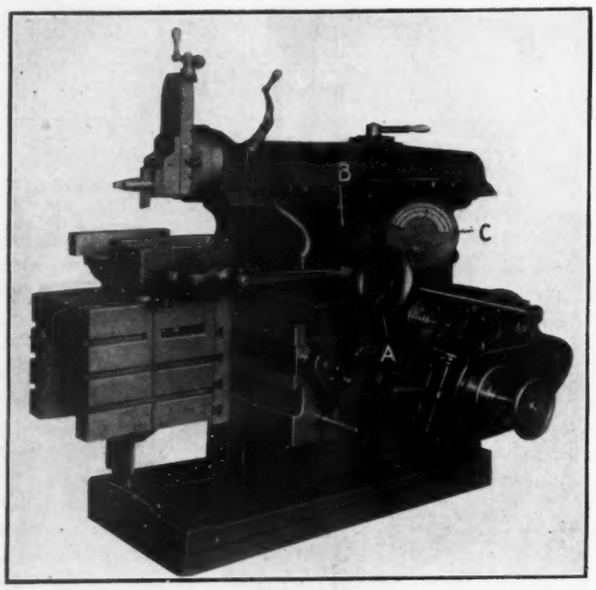


FIG. 1—SHAPER EQUIPPED WITH A SPEED DIAL AND AUTOMATIC STARTING CONTROL

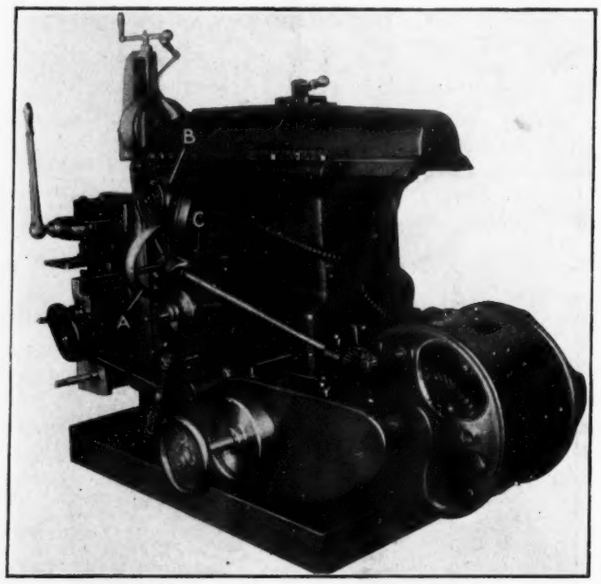


FIG. 2—ANOTHER VIEW OF THE SHAPER, SHOWING THE MOTOR AND CONNECTIONS FOR THE SPEED DIAL AND AUTOMATIC CONTROL

Inductance of Coils

A bulletin, entitled "The Inductance of Coils," by Morgan Brooks and H. M. Turner, which discusses the theory and determination of the self-inductance of coreless coils, has been issued by the engineering experiment station of the University of Illinois. An empirical modification of the common formula for the inductance of solenoids is presented as the Brooks universal formula, applicable to all forms of cylindrical coils. Easy methods are given for pre-determining the dimensions of a coil for any required reactance or inductance for any purpose from the massive power protective coils to the smallest instrument coils. Definite coil proportions are assigned for producing the maximum inductive effect with a given length of conductor and data are furnished on the relation of the mutual inductance of adjacent coils to their self-inductance.

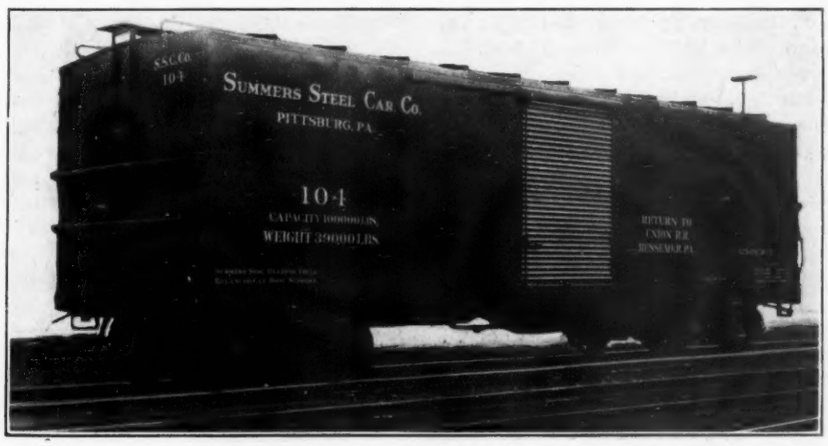
The Illinois Malleable Iron Co., Chicago, has increased its number of directors from three to five.

Summers Steel Box Car

The Bessemer & Lake Erie Railroad Co. has placed an order with the Summers Steel Car Co., Pittsburgh, for 100 50-ton capacity steel box cars. The new cars will be of the same general design as the trial car which has been in service on the Bessemer road for several years, with the exception that the new cars will be 4 feet longer and the truck side frames will be of the regular arch bar type, but equipped with the Summers balanced side bearing device. This balanced side bearing feature is a radical departure in car construction, as it permits a car body of rigid construction to traverse twisted and rough track without imparting the twist to the car body and without danger of derailment. The new truck is sufficiently flexible to permit the car to travel over irregular track without distorting the car body and prevent the hammering blows due to transverse rocking, which has proved detrimental to equipment, lading and roadbed. The general dimensions of this type of steel car follow: Inside length, 40 feet; width, 9 feet, and height, 8 feet.

The car is of the plate girder type of construction, the floor plates being 1 inch thick; side sills, 5/16 inch; end sheets, one-half their height, ¼ inch; side sheets, one-half their height, 3/16 inch, and the balance of the side sheets and roof are ⅛ inch in thickness. The entire roof construction is to be made of Carnegie copper steel. The car sides are stiffened with 3 x 5/16-inch Z bars and the floor beams are made of 10-inch channel sections extending from side to side of the car, the entire vertical load being carried on the side girders. With this type of construction the car weighs 43,000 pounds, or about 3,000 pounds less than a steel underframe car of similar capacity, and the same inside dimensions. The car contains 12,000 pounds more steel than is used in a steel underframe car and considering steel and lumber at present prices, this car can be sold in competition with the steel underframe car.

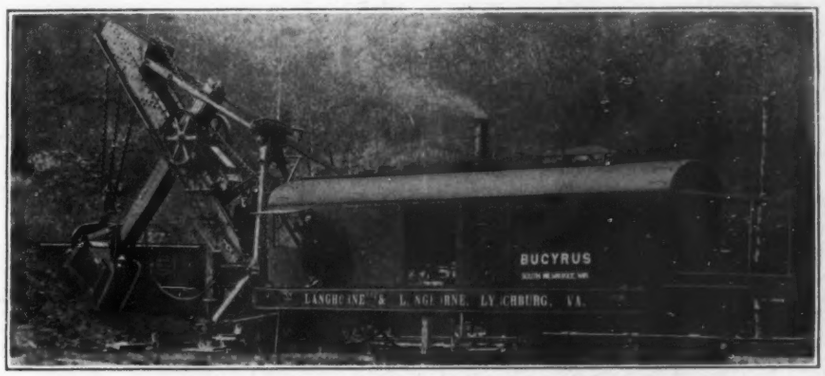
The trucks are so arranged that the whole load is carried on the inclined hangers at the side of the car, approximately the same as if it were suspended from a point at the intersection of the center line of the hangers extended until they meet above the center of gravity of the car. This arrangement permits the car body to swing sideways at the bottom, but eliminates side swaying at the top. The trucks also are provided with helical springs, located between the center pin and truck transom, which serve to check and cushion the transverse swerve of the car body when running on curves or on uneven track. These springs also come into action when the car is traveling at high speed and absorb vibrations independent of the car body and the truck. This type of side bearing truck makes it possible to carry the load distributed upon all side bearings and under any track conditions.



THE SUMMERS STEEL BOX CAR

Bucyrus 80-Ton Mining Shovel

The Bucyrus Co., South Milwaukee, Wis., recently designed and is now building a new steam shovel rated at 80 tons. This type of shovel has been built to meet the requirements of stripping contractors and iron mining companies for a machine which is more powerful than the 70-ton shovel and yet easier to move about and lighter than the 95-ton machine. The new shovel has been developed along the lines of the 70-ton type, but with greater weight and power. The boom is of the parallel, timbered square type and the boom engine is bolted to the timbers at three points, thus allowing sufficient play when the boom is twisting under the strains of heavy digging. This construction prevents the engine bed from cracking.



BUCYRUS 80-TON SHOVEL ON STRIPPING WORK IN THE SOUTH

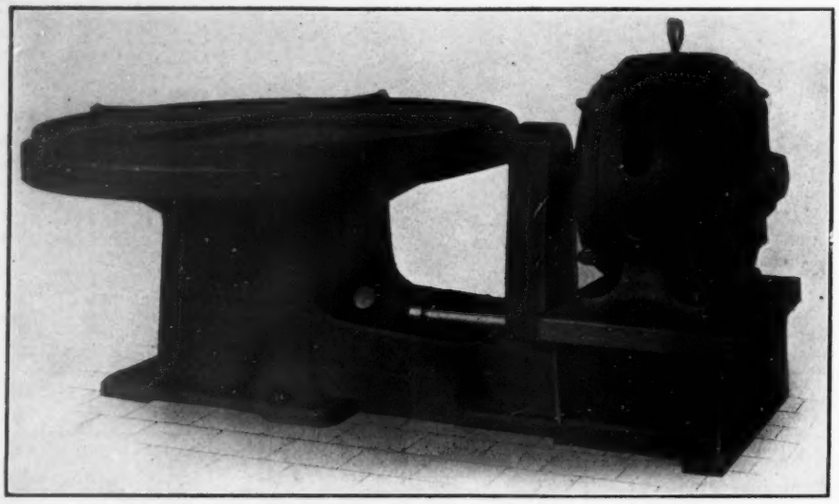
Experience with steam shovels engaged in heavy duty has shown that the racks and pinions wear out probably more rapidly than any other part of the machine. On the new 80-ton shovel, therefore, these parts are made of manganese steel. The racks are riveted to the bottom of the dipper handle.

The whole front end of the shovel frame is practically one solid steel casting. This portion of the shovel is required to withstand, either directly or indirectly, all of the strains incurred in digging, and a single casting is preferred at this point to several small castings which would eventually work loose. The base plate on which the boom revolves and which contains the sockets for the A-frame legs and jack arms, butts directly against a long, heavy bolster extending under the car beam from one side of the shovel to the other. The bottom anchorages for the jack arms and the side and center bearings are cast integral with the bolster. The spread of the jack screws is 20 feet. The trucks, which are all-steel, of the diamond pattern, are specially designed to withstand the heavy stresses encountered in mining work. An extra large locomotive type boiler is installed. The boiler feed consists of two injectors and one duplex steam pump. The main engines are double with cylinders

12 inches in diameter by 15 inches stroke.

The shovel is equipped with a 4-yard dipper, but one of 3½ yards capacity is recommended for extra heavy digging in rock. The 4-yard dipper gives the machine great capacity in stock-pile work or similar service. A 1⅜-inch hoisting chain is employed.

In working order, this shovel weighs 101 tons, its shipping weight being 88 tons. It has a clear lift from the track to the bottom of the dipper door, when the latter is open, of 16½ feet. The extreme height from the top of rail to the upper point of the boom is 29 feet, 1½ inches, and the extreme height of the A-frame is 19 feet; the latter, however, is arranged to lower down to 14½ feet. At an 8-foot elevation the machine will excavate 33 feet on either side of its center line. The car is 41 feet, 4 inches in length and 10 feet in width over all. This shovel will dig any material that is ordinarily met with in stripping or mining ore and is light enough to be much more easily handled and rapidly moved than the 95-ton machine.



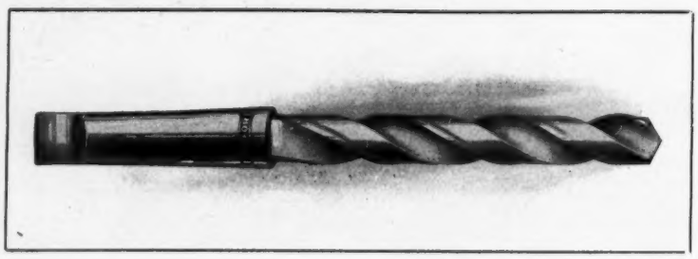
MOTOR-DRIVEN, VERTICAL SPINDLE DISC GRINDER

Motor-Driven Disc Grinder

In the accompanying illustration is shown a new type of motor-driven disc grinder, built by the Gardner Machine Co., Beloit, Wis., which is equipped with a vertical type spindle with a disc wheel, 53 inches in diameter. A 15-horsepower motor mounted on the pedestal at the right drives the main shaft of the machine by a silent chain. The shaft drives the disc wheel spindle through bevel gears, which are fully enclosed and are immersed in oil. The pedestal for the motor is made in different sizes to accommodate motors of different types. The starting box is attached at the rear of the base and the chains and gears are enclosed. When these machines are installed in plants not equipped with exhaust system, an exhaust blower is furnished, the driving pulley for which is attached to the driving shaft between the collar and the silent chain gear. The disc wheel is operated at a speed of 500 revolutions per minute and the machine weighs 4,500 pounds. This type of machine also is made for overhead belt or underbelt drive. The motor-driven type, however, proves more convenient when the machine is to be placed underneath a hoist or crane runway.

A New Twisted Drill

The accompanying illustration shows a new concave drill which has been perfected by the Celfor Tool Co., Railway Exchange building, Chicago. The drill is forged from selected bar stock and twisted to shape while hot. It has the general appearance of a milled, high-speed drill, which style is claimed to have the best cutting qualities. The twisting process is said to give elasticity to the steel, making this tool especially serviceable under rough usage. The shank is nickel steel of extra large size and may be fitted with oil tubes for conveying the lubricant to the point of the drill. This tool is manufactured in varying sizes ranging from ¼ inch up to 2 inches in diameter.



A NEW TWISTED DRILL

Book Review

Second Supplement to the Directory to the Iron and Steel Works of the United States; 80 5½ x 8½-inch pages; published by the American Iron and Steel Association, Philadelphia, and furnished by THE IRON TRADE REVIEW for $5, postpaid.

This supplement, and its predecessor in 1910, brings down to the close of 1911 all essential details concerning the new iron and steel plants which have been completed or undertaken since the publication of the directory in 1908. It includes also, important changes that have since taken place in the ownership and equipment of plants that have previously been described. Appreciating the need by the iron trade of a complete list of the blast furnaces of the United States that were in existence or were under construction at the end of 1911, whether built or undertaken since the appearance of the directory of 1908 or previously, a complete list of these plants has been compiled and is presented in this directory. A new department also has been added which is devoted to the electrical and ferro-alloy plants identified with the iron trade or which are largely dependent upon it. James M. Swank, general manager of the American Iron and Steel Association, announces that it will be impossible to compile and publish another edition of the directory in 1912.

The Pittsburgh Screw & Bolt Co. Pittsburgh, which is erecting a new plant at Gary, Ind., recently purchased approximately $40,000 worth of motor-driven machine tools, which will be employed exclusively in the making of dies for the new Gary works, which will be ready for operation about May 1. The shop will be equipped with approximately 300 of the latest type of bolt, nut and rivet manufacturing machines.

Iron and Steel Securities

Last week's business on the New York stock exchange was accompanied by a sustained upward movement on the part of security prices and the general list moved to a new high average for the year.

Monday the market was active, firm and higher; more gold was engaged for export to South America; foreign markets irregular. Tuesday, stocks went to a new high average for the year and then reacted; additional gold was engaged for shipment to South America; London market was firmer on the introduction in parliament of a bill providing for a minimum wage for coal miners. Wednesday, prices advanced to the highest for the year in the final dealings; foreign markets improved slightly. Thursday, stocks reacted slightly after reaching a new high average; foreign markets irregular. Friday, stocks went to a new high average for the year and then declined slightly; foreign markets improved in tone. Saturday's market was the strongest of the week, industrials leading the upward movement; the list closed at or near the best.

Money on call ranged between 2½ and 2¼ per cent. Time money was in light demand; rates continued firm. The actual condition of clearing house institutions showed loans decreased $1,020,000; net deposits decreased $1,372,000; total reserve $441,626,000, and the excess of reserve $12,235,100, a decrease of $4,750,800. Non-member banks and trust companies showed loans increased $3,172,200; net deposits increased $5,750,600; reserve on deposits increased $790,600, and the percentage of reserve 19.2, against 19.3 the week previous. Fortnightly railroad statistics showed an idle car surplus of 3,043, compared with 7,842 the preceding fortnight; the surplus is now smaller than at any time since November of 1909. Bank clearings showed a decrease of 1.9 per cent from the preceding week, but an increase of 18.1 per cent over the corresponding week in 1911. Commercial failures numbered 273, compared with 279 the previous week and 259 the corresponding week last year. Shares were sold to the number of 2,777,600, compared with 2,688,400 the preceding week and 1,212,323 the corresponding week last year. Bonds, exclusive of government bonds, were sold to the amount of $16,475,000, compared with $14,121,000 the preceding week and $10,078,000 the corresponding week last year.

	Clos'g Quo. Mar. 23	Changes in week.	Annual Meeting date 1912	Stock Outstanding	Basis.	Dividend Last Dividend	Dividend Date Last Div. Pay
Allis-Chalmers	⅜	.....		$19,820,000		.....	
Allis-Chalmers, pr	3½	— ½		16,050,000	7 cum.	1¾ Q.	Feb., 1904
American Can	19¾	+5¼	Feb. 6	41,233,300		.....	
American Can, pr	104¼	+9⅜		41,233,300	7 cum.	1¾ Q.	Apr., 1912
Am. Car & Fdy	57¼	+2¼	June 27	30,000,000	2	½ Q.	Apr., 1912
Am. Car & Fdy., pr	117¼	+1¼		30,000,000	7 n. c.	1¾ Q.	Apr., 1912
American Loc	39	+2½	Oct. 15	25,000,000	5	1¼ Q.	Aug., 1908
American Loc., pr	108	+1½		25,000,000	7 cum.	1¾ Q.	Apr., 1912
American Ship	47⅝	.....	Oct. 9	7,600,000	4	2 Q.**	June, 1911
American Ship, pr	103¾	+1¼		7,900,000	7 n. c.	1¾ Q.	Jan., 1912
Am. Steel Foundries	31⅝	+2	Mar. 21	17,184,000	5	1¼ Q.	May, 1911
Barney & Smith	15	.....	June 4	2,000,000	4	1 Q.	Dec., 1907
Barney & Smith, pr	85	.....		2,500,000	8 cum.	2 Q.	Dec., 1911
Bethlehem Steel	31½	+1	April 2	14,862,000		.....	
Bethlehem Steel, pr	60½	+ ¼		14,908,000	7 n. c.	¾ Q.	Feb., 1907
Cambria Steel	42¼	+ ¼	Mar. 19	45,000,000*	5	1¼ Q.	Feb., 1912
Cambria Iron	44	— ¾		8,468,000*	4	2 S. A.	Apr., 1912
Chicago Pneumatic Tool	46½	+2½	Feb. 19	6,448,800	4	1 Q.	Jan., 1912
Colorado Fuel	29½	+3	Oct. 21	34,235,500		1¾ Q.	April, 1902
Crucible Steel	11½	+ ⅛	Nov. 15	24,578,400		.....	
Crucible Steel, pr	83¼	+ ⅛		25,000,000	7 cum.	1¾ Q.	Mar., 1912
Empire Steel	10	.....	Feb. 28	1,254,770		.....	
Empire Steel, pr	36	.....		2,500,000	6 cum.	2 S. A.	July, 1911
Fay & Egan	70	.....	Feb. 20	1,000,000	7	1¾ Q.	Nov., 1908
Fay & Egan, pr	110	.....		1,000,000	7 cum.	1¾ Q.	Feb., 1912
General Electric	167⅜	+2⅜	May 14	77,281,200	8	2 Q.	Apr., 1912
Harbison-Walker	40	.....	Jan. 15	18,000,000	2	½ Q.	Mar., 1912
Harbison-Walker, pr	100	.....		9,600,000	6 cum.	1½ Q.	Jan., 1912
International Pump	30⅜	— ⅛	Dec. 10	17,762,500		½ Q.	Apr., 1905
International Pump, pr	82⅜	+ ⅞		11,350,000	6 cum.	1½ Q.	Feb., 1912
Lackawanna Steel	29	—1	Mar. 13	34,978,000		.....	
Lake Sup. Corp	29½	+ ½	Oct. 2	40,000,000		.....	
New York Air Brake	55⅛	+2⅜	Mar. 13	10,000,000	6	1½ Q.	July, 1911
Niles-Bement-Pond	95	.....	Feb. 7	8,500,000	6	1½ Q.	Mar., 1912
Niles-Bement-Pond, pr	101	—3		2,000,000	6 cum.	1½ Q.	Feb., 1912
Otis Elevator Co	77	.....	Mar. 18	6,358,600	4	1 Q.	Apr., 1912
Otis Elevator Co., pr	101	.....		6,375,300	6 n. c.	1½ Q.	Apr., 1912
Pa. Steel	60	.....	May 13	10,750,000		.....	
Pa. Steel, pr	100¼	.....		20,587,500	7 n. c.	3½ S. A.	Nov., 1911
Pittsburgh Coal	19	+ ⅜	Mar. 12	28,104,600		.....	
Pittsburgh Coal, pr	79⅞	+ ⅜	Oct. 7	27,071,800	7 cum.	1¾ Q.	Jan., 1912
Pittsburgh Steel Co., pr	101⅞	.....	Feb. 21	7,000,000	7 cum.	1¾ Q.	Mar., 1912
Pressed Steel Car	34⅜	+1⅛		12,500,000		1 Q.	Aug., 1904
Pressed Steel Car, pr	101	.....	Nov. 13	12,500,000	7 n. c.	1¾ Q.	Feb., 1912
Pullman	160	.....	Mar. 7	120,000,000	8	2 Q.	Feb., 1912
Railway Stl. Spring	32⅛	+2⅝		13,500,000	2	1 S. A.	Oct., 1908
Railway Stl. Spring, pr	100⅛	+ ⅛	Oct. 16	13,500,000	7 cum.	1¾ Q.	Mar., 1912
Rep. Iron & Steel	22	+1¼		27,191,000		.....	
Rep. Iron & Steel, pr	73¼	+1⅛	Mar. 13	25,000,000	7 cum.	1¾ Q.	Jan., 1912
Sloss-Sheffield	48½	+5		10,000,000	5	1¾ Q.	Sept., 1910
Sloss-Sheffield, pr	112	.....	June 26	6,700,000	7 n. c.	1¾ Q.	Apr., 1912
U. S. Pipe & Fdy. Co	16	+1½		12,500,000		1 Q.	Dec., 1907
U. S. Pipe & Fdy. Co., pr	53	+1¼	April 15	12,500,000		1¼ Q.	June, 1911
U. S. Steel	68⅞	+3⅜		508,302,500	5	1¼ Q.	Mar., 1912
U. S. Steel, pr	113½	+2¾		360,281,100	7 cum.	1¾ Q.	Feb., 1912
U. S. Steel 5s	102⅞	— ⅛	Sept. 17	465,189,500	5	5 Q.‡	
Va. Iron, Coal & Coke	64	+1½	Oct. 1	9,073,680		.....	Oct., 1907
Westinghouse Air Brake	163	+1	June 12	14,000,000*		5. †	Apr., 1912
Westinghouse Electric	79	+4		3,998,700*	7 cum.	1¾ Q.	Apr., 1912

Par value of shares, $100, except those starred (*). $50.
**Includes last 1 per cent payment of 4 per cent extra.
†Stock.
‡Include 2½ regular, 1½ extra and 1 special.

Copper Stocks

New York.—Amalgamated Copper closed 80, a net gain of 7⅞.

Boston.—Anaconda closed 40½, no change; Calumet & Arizona closed 67½, a net gain of 5¼; Calumet & Hecla closed 469, a net gain of 21; North Butte Mining closed 31, a net gain of 2¾; Quincy Mining closed 82, a net gain of 2½.

Financial Notes

The Dominion Iron & Steel Co. has declared its semi-annual dividend of 3½ per cent on preferred stock, payable April 1.

The Dominion Steel Corporation has declared the regular quarterly dividend of 1 per cent on common stock, payable April 1.

Union Switch & Signal Co. has declared the regular quarterly dividend of 3 per cent on the common and 3 per cent on the preferred stocks, payable April 1.

The United States Smelting & Refining Co. has declared the regular quarterly dividend of 1¾ per cent on preferred stock and 1 per cent on common, both payable April 15.

The American Rolling Mill Co. has declared the regular quarterly dividends on common and preferred stocks, payable April 15. The preferred dividend is 1¼ per cent and the common 3 per cent.

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FINED FOR SQUARE DEALING

But the Ultimate Result Promises to be Good

The Ohio & Western Pennsylvania Dock Co. (The Hanna company) and the Pennsylvania Co. have been fined for what they believed to be square dealing, what they still believe to have been square dealing, and what we believe was square dealing. However, the agitation which has resulted in fines being imposed upon them and other defendants promises to bring about highly desirable reforms. At the same time, we are firmly of the opinion that these reforms might have been effected without being unnecessarily severe upon any company or individual. We believe that criminal proceedings were entirely unnecessary. Judge Putnam, the venerable jurist who presides over the district court of the United States in Massachusetts, in a recent decision in the shoe machinery case, pointed out that the framers of the Constitution of the United States lived at a time when the recollection of the cruelties of tyrannical proceedings and the suffering and injustice coming therefrom were fresh and to a large extent topics of consideration. The judge said that the favorite resources of tyrants were punishing alleged crimes which had no existence prior to the punishment, and the arresting and holding in imprisonment for indefinite periods and afterward forfeiting property and life. The judge might have added that modern cruelties of people in high office are today more refined, but none the less real. Judge Putnam declared that until laws are so clearly interpreted by the courts that any intelligent man can understand when he is not acting legally, the criminal provisions of the statutes ought not to be resorted to. Speaking of prosecution in the shoe machinery case, under the Sherman law, Judge Putnam said:

> We are unable to understand why the Department of Justice directs, and the President permits, criminal proceedings like this until, in the particular case, the practical application of the statute has been settled by civil proceedings, in view especially of the fact that the flexible methods of bills in equity are capable of exploiting all doubtful questions much more thoroughly, and with more just results, than criminal proceedings.

The same observation might have been applied to the cases which were disposed of Saturday. By consultation, and perhaps with mutual concessions, the result desired by the government officials could have been attained without threats of imprisonment, had they acted as wisely in the beginning of the inquiry as they have during the past few months, after being enlightened by experience and informed by investigation.

A Bit of Reminiscence

We wish now to recall several statements which were made last April, after the indictments were found. In an editorial published in THE IRON TRADE REVIEW, May 4, 1911, we said:

> The statements made by Messrs. McCrea, L. C. Hanna and Samuel Mather indicate that the spirit of the law was not violated. Whether there was violation of the letter of the law, must be decided by the courts.

In the same issue, the statement from President McCrea, of the Pennsylvania Co., was published, in which he said:

> The indictment of Mr. Hanna, president of the dock company, and Mr. McCabe, vice president of the railroad company, for alleged conspiracy, appears to be due solely to the fact that it was they who executed, on behalf of their respective companies, this contract, by which the exact and absolute equality of rates to all consumers of ore forwarded from the Pennsylvania Co.'s docks was guaranteed.

Samuel Mather, with honorable frankness, said, concerning the methods of the Hanna dock companies:

> Their allowances or distributions are, if anything, even more equitable than those of other dock companies, and certainly if they or we have been guilty of violating the law in any respect, this is the first

suspicion or intimation any of us has ever had of it.

The facts developed since the above statements were made have demonstrated their absolute truthfulness. Why, then, were the Hanna and the Pennsylvania companies fined? Simply and solely because the fact that they were distributing earnings of their docks more equitably than other companies were doing, was not published in the tariffs. They were punished for not blazoning their own honorable methods to the world. Such, it seems, was the letter of the law.

The Different Methods

What was the difference between the methods of the Pennsylvania Co., and the Hannas, on the one hand, and those of other companies? Simply this: In one case, if the Smith Steel Co. shipped one ton or millions of tons, it received the refund pro rated according to the amount of ore handled. That was the Pennsylvania-Hanna method. On the other hand, if the John Doe Steel Co. owned stock in a dock company not owned or operated by the Pennsylvania or Hanna interests, it received at the end of the year tremendous profits, paid to the dock company by its competitors in the steel business. Was it strange that the Richard Roe Steel Co. complained that money was being extorted from it to be paid to its competitors? Not at all. Was it strange that Mr. Mather asserted that the Pennsylvania method was more equitable than other dock companies? Certainly not. The complaint of companies, which really had a grievance, resulted in agitation and indictments, and we wish to repeat that we believe this was not demanded by the cause of justice, so far, at least, as the Pennsylvania Co. and the Hannas were concerned. All agree now that there was no sound reason for punishing Messrs. McCabe, Ireland and Hanna, who, after resting for nearly a year under the stigma of indictment of a penitentiary offense, are now dismissed and are heartily to be congratulated upon their vindication.

The Ultimate Result

Nevertheless, in spite of the fact that these three men were unnecessarily placed in jeopardy, and of the further fact that reforms might have been accomplished without any criminal prosecution, we believe that, as the result of these prosecutions, ore handling will soon be done by simpler methods, at decreased cost to the shippers. The plan will be as equitable as that devised by the Pennsylvania-Hanna companies and will have the additional merit of being absolutely open to the world. In other words, we believe that the Interstate Commerce Commission will not allow the John Doe Steel Co. to be charged excessive rates to be paid into the treasury of the Richard Roe Steel Co., nor will anybody be compelled to pay exorbitant charges.

A word in conclusion in commendation of the Interstate Commerce Commission and Department of Justice, District Attorney Denman, and Judge Killets. The members of the commission, after committing what seems to us the error of aiding in too drastic proceedings, changed their attitude and displayed broad statesmanship, sound common sense and keen appreciation of justice, in thoroughly investigating the charges and in recommending to the Department of Justice that Messrs. McCabe, Hanna and Ireland be sent out of court without the slightest tarnish on their reputation as men of honorable business methods, and that the demand of technical justice be met by fines imposed on the companies. Likewise, the Department of Justice, the district attorney and the learned judge are deserving of approbation for carrying out the recommendations of the commission. If all officials, whose duties include the enforcement of laws relating to industrial concerns, were actuated by as high motives and conducted themselves as wisely as Messrs. Lane, Denman and other officials in concluding these cases, and could be as well and equitably aided as they were by the attorneys for the defense, the solution of many perplexing problems growing out of the relation of the people to the mighty corporations which have been developed with amazing rapidity during the past few years would be hastened.

The conclusion of this prosecution gives reason for believing that, sooner than men have dared hope, will come the dawn of the day when great industries will be conducted under wise governmental supervision, without farcical dissolution suits, without unnecessary interference with business, without unjustifiably harsh methods, but with equality of opportunity and with justice for all.

Tendencies Indicated by Ore Prices

The new Lake Superior iron ore prices are of unusual interest this year for several reasons. We have referred elsewhere in this issue to the fact that the wiping out of the prejudice against Mesabi ores has found expression in almost abolishing the differential which has existed since the shipment of ores was started from the mines, which afterward developed

into the great Mesabi region. At last, Mesabi ores have come into their own.

The question naturally arises, is this a just decision, or, in other words, ought there not to be a differential in favor of the old range ores? It seems to us that the answer is that there ought to be a differential against some Mesabi ores, but not against others. In other words, while we do not profess to be ore experts, it seems to us that the fact that an ore happens to come from the Mesabi range is not necessarily a reason for selling it at a lower price than if it happens to come from the Menominee, the Marquette, or any other range. It is not a matter of geography or of nomenclature, but of actual quality of ore. A number of years ago, when the use of Mesabi ores was begun, and there was much opposition to them on the part of furnace men, the ores from the new range were graded by sieve tests and the lower prices were made on the finer grades which showed a large percentage of fine ores through an one-hundred mesh sieve. Many furnace men in the early days considered it impossible to use the finer grade Mesabi, but gradually they learned how to use it, and sieve tests were abandoned. We believe, however, that much can be said in favor of restoring tests which will result in making some reduction in prices on very fine ores.

The present method of determining ore values is far from perfect, and questions are bound to arise as to the value of the silica unit; as to whether there is not to be a penalization of an increase in silica above a certain point; what effect excessive alumina has as a detriment to an ore; at what point in sulphur shall the ore suffer penalization; what values shall be given to manganiferous grades, which at the present time take a differential from the standard ores, fixed commercially, the dealer getting the best price he can without regard to any method of figuring the values.

Future years will see not only conservation of iron ore, but a more equitable and scientific method of determining values will be arrived at, a method fairer to both ore miner and ore consumer.

Another interesting feature of the new price is that for the first time in the history of the iron ore trade the reduction in the price of Bessemer ores is greater than that for non-Bessemer. By the rapid increase in production by the open-hearth process, the relative importance of the Bessemer product is decreased. The outlook is that before many years the production of steel by the Bessemer process will be considerably below that by the open-hearth process, and it is not surprising that this tendency of the times is shown in the new price schedule.

The Steel Corporation's Operations

Earnings of the United States Steel Corporation were $104,305,466 in 1911, its production of steel for sale to outsiders being 9,476,248 tons, which works out $11.07 per ton, against $13.14 in 1910 and $15.51 in 1907, the best year since 1902, when the average was $16.59. The poorest showing per ton was in 1904, with $10.77. The earnings per ton increased year by year from 1904 to 1907, and then as continuously decreased to 1911.

At the present time, the Corporation's earnings per ton are much lower than the average of any preceding year. Without attempting to make precise estimates, it may be stated that at the present moment the production is running at more than 12,000,000 tons a year (for 12,000,000 tons would be only 85 per cent), while earnings are running at less than $100,000,000 a year. Nevertheless, $100,000,000 and 12,000,000 tons would be $8.33 per ton, so that the actual average must be considerably below this, comparing with the minimum for a year thus far of $10.77, in 1904. It will, therefore, be seen that for the Corporation to have a good year in total earnings it will be necessary for considerably higher prices to be secured, there being little room for improvement in the matter of tonnage.

As statistics of steel ingot and rolled steel production in the United States are not yet available for 1911, comparisons of the Corporation's tonnage to total cannot be made at this time. Its output of pig iron, spiegel, ferro-manganese and ferro-silicon was 10,744,897 tons, a decrease of 9 per cent from 1910. The production of the United States decreased 13 per cent, and the proportion of the Steel Corporation increased from 43.3 per cent in 1910 to 45.4 per cent in 1911. A part of this increase in proportion was due to the fact that the Corporation carried no pig iron stocks, whereas stocks of merchant pig iron accumulated in 1910 and were consumed in 1911, making the merchant furnace output in 1911 less than the general state of activity would require. A further influence probably was that the disappearance of the controlled market and the consequent aggressive sales policy of the Corporation gave it a larger proportion of the finished steel business than it had formerly taken. Its larger export trade was also a factor.

The output of the Gary plant was as follows:

	1910.	1911.
Pig iron	729,072	707,273
Rails	435,142	281,980
Other rolled steel	340,993	469,360
Total rolled steel	776,135	751,340

The decrease in rail output is rather startling, being 35 per cent. The output of other rolled steel for sale increased, however, so that there was a decrease of only 3 per cent in the total rolled steel. The fact that rolled steel ran 6 to 7 per cent ahead of pig iron in each year should not be taken as proving that Gary was a large consumer of outside scrap. In 1909, the plant produced 120,761 tons more pig iron than rolled steel, the opposite of the experience of 1910-11.

The Steel Corporation has been passing through a period of reduced earnings, but finds its cash on hand but slightly reduced. The highest amount at the close of a year was $67,636,808, in 1906, while at the close of 1910 the amount was $56,953,514, and at the close of 1911, $43,499,128. The Corporation has an unusually small new construction program on hand, its plants being in excellent physical condition.

While the Corporation's total bonded indebtedness has not decreased, the fact is due to the purchase of various properties. The two great issues have decreased, the original $303,957,000 of first mortgage bonds being now represented by only $270,277,000 outstanding, while the $200,000,000 of second mortgage bonds, issued chiefly in 1903, have been reduced to $189,346,500 outstanding, the balance lying in sinking funds in each case.

OBITUARIES

David A. Dangler, one of the organizers of the American Stove Co., died Monday, March 25, at his home, 3010 Prospect avenue, Cleveland. He was 89 years of age and had retired from active business ten years ago. He suffered a stroke of paralysis in 1902 which had affected him physically, but his mind always remained clear and he was active with business plans until his death. Mr. Dangler was born on a farm near Lebanon, Pa., and after working in Canton and Massillon, O., came to Cleveland in 1852. He had little early opportunity for schooling, but obtained his education by reading. He formed the Tennis & Dangler Co., a wholesale hardware concern, and afterwards engaged in the business of making vapor stoves. He was president of the Dangler Stove & Mfg. Co., and became manager of the works when the company was merged with the American Stove Co. In 1868 he became interested in politics and served successively as councilman, state representative and state senator. He had been a widower for several years.

Edward Sabine Renwick, a noted inventor and patent expert and author of "Practical Invention", died March 19, at Short Hills, N. J., aged 90 years. After leaving college, Mr. Renwick became superintendent of an iron works in Wilkesbarre, Pa., but after 1849 devoted his time to serving as an expert in patent cases. In 1862 with his brother, Henry B. Renwick, he won distinction by repairing the steamship Great Eastern while afloat, replating a fracture in the bilge 82 feet long and 10 feet in greatest width. He was a member of the American Society of Mechanical Engineers and other societies.

A. N. Verdin, aged 66 years, president of the Verdin, Kappes & Verdin Co., Cincinnati, manufacturers of special machinery, died at his home in Walnut Hills, that city, on March 17, from a complication of diseases. Mr. Verdin was a well-known mechanic and at one time was superintendent of the Consolidated Time Lock Co., Cincinnati, where he perfected several inventions of his own. He has also installed some of the most famous mechanical time clocks in cathedrals and other buildings throughout the world.

Frank J. Firth, former president of the Erie & Western Transportation Co. (Anchor Line), the lake end of the Pennsylvania railway, died at his home in Philadelphia, on March 18. He was well known in railway and lake circles and served for a year as president of the Lake Carriers' Association. Owing to failing health he retired from active connection with the Anchor Line a few years ago and had devoted his leisure to literary work. He wrote a book entitled "Christian Unity in Effort".

William Charles Towen, president of the Eastern Shipyard Co., and vice commodore of the National Yacht Club, died March 19, at the Hotel Knickerbocker, New York, at the age of 54 years. He was born and educated in Detroit, Mich., and served in the United States navy from 1875 to 1879, being attached to the Vermont and Tennessee. He was a vice president and director of the Frazer Hollow Boat Co.

Elias G. Heller, president of Heller Bros. Co., file manufacturer, Newark, N. J., died in that city March 22, following a stroke of apoplexy. Mr. Heller was born in Newark 75 years ago. He was president of the Association of File Manufacturers of the United States, president of the Heller Tool Co., and was largely interested in real estate.

George Hardie, one of the pioneer mining men on the upper peninsula of Michigan, died at 4845 Madison avenue, Chicago, March 24. He was 88 years old, having been born in Edinburg, Scotland, in 1824. His chief interests were in Michigan copper properties, which he developed in the early fifties.

A. P. Duncan, president of the Waco Supply & Machinery Co., died at Waco, Tex., March 19, as a result of being shot. The shooting is said to have followed a business quarrel. Another Waco merchant, Alexander Johnson, was placed under arrest.

George Arms, who became wealthy in civil war times in the manufacture of swords and firearms, died March 16, in New York City, at the age of 83.

Abraham Snyder, who has been secretary-treasurer of the Buffalo Gasolene Motor Co., Buffalo, N. Y., died Tuesday, March 12.

David D. Drummond, vice president and manager of the Chicago Portland Cement Co., died March 8 at his home, Oglesby, Ill.

CAMBRIA STEEL ELECTS

Old Officers and Retiring Directors at Annual Meeting.

At the recent annual meeting of the Cambria Steel Co., held in Philadelphia, the following officers and retiring directors were re-elected: President, Charles S. Price; vice president, Alexander P. Robinson; treasurer and assistant secretary, Edward T. Stuart; secretary, D. Brewer Gehly; assistant treasurer, Louis D. Kruse. Directors: Powell Stackhouse, R. Francis Wood and Charles S. Price. The remainder of the board consists of George F. Baer, Theodore N. Ely, Frederick Krebs, Effingham B. Morris, Edward T. Stotesbury and William H. Donner.

The annual meeting of the Cambria Iron Co. was also held in Philadelphia on March 19, and the retiring officers and directors were re-elected.

Chooses Officers

At the annual meeting of the Temple Iron Co., held at Philadelphia, George F. Baer, president of the Philadelphia & Reading Railroad, was re-elected president. The following directors were chosen: George F. Baer, E. T. Stotesbury, Philadelphia; E. B. Thomas, president of the Lehigh Valley Railroad; F. D. Underwood, president of the Erie Railroad; Albert Broden, superintendent of the blast furnaces of the Reading Iron Co.; W. H. Truesdale, president of the Delaware, Lackawanna & Western Railroad; Thomas P. Fowler, president of the New York, Susquehanna & Western Railroad; F. C. Smink and W. J. Richards, general manager of the Philadelphia & Reading Coal & Iron Co.

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Harry Higgins, of the Otis Steel Co., Cleveland, who has been ill for several weeks, is recovering.

James L. Gough has accepted the position of Indiana sales manager of the E. L. Essley Machinery Co., Chicago.

Chairman E. H. Gary, of the United States Steel Corporation, has returned from a several weeks' sojourn in Florida.

H. U. Birdseye, assistant sales manager of the Detroit Graphite Co., Detroit, Mich., has returned from a month's trip to Mexico.

G. A. Andresen has been placed in charge of the foundry supply and equipment department of the Chicago Fire Brick Co., Chicago.

Albert Broden, superintendent of furnaces for the Reading Iron Co., is on a business trip to Mexico and expects to return about April 1.

C. H. McCullough Jr., vice president and general manager of the Lackawanna Steel Co., who has been on an European trip, is about to return.

C. W. P. Ramsey has been appointed engineer of construction for the eastern lines of the Canadian Pacific railway, with headquarters at Montreal.

W. C. Frye, general manager of the Chain-Belt Co., Milwaukee, Wis., who left some weeks ago for a trip through Europe, expects to return home about May 1.

W. P. Carroll has just been named as master mechanic at West Albany, N. Y., of the Mohawk division of the New York Central & Hudson River railroad.

F. W. Horrobin, for many years associated with the Waterbury Crucible Co., Waterbury, Conn., is now affiliated with the Chicago Fire Brick Co., Chicago.

W. J. Crandall has been appointed master mechanic of the Rochester division of the New York Central & Hudson River railroad, with offices at Rochester, N. Y.

W. W. Blakely, for many years connected with the Baldridge Gear Co., of Detroit, has severed his connection with that company, and has gone in business for himself.

John S. Runnells, president of the Pullman Co., is seriously ill at his home, 1525 North State street, Chicago. His condition is not considered dangerous at present.

C. L. Benjamin, advertising manager of the Cutler-Hammer Mfg. Co., Milwaukee, Wis., is spending a few weeks at the eastern factory of the company at New York.

C. H. MacMillan, well known expert, has resigned his position as general superintendent of the Dominion Steel Corporation and will leave Sydney, N. S., early in April.

W. W. Chaffin has resigned his position of engineer in charge of track elevation for the Pennsylvania railroad, at Ft. Wayne, Ind., to become city engineer of that city.

H. G. Willson, secretary and manager of the Pittsburgh Shafting Co., Detroit, Mich., was operated upon last week for appendicitis. He has rallied strongly from the operation.

E. G. Hewson has been promoted to the position of resident engineer of the Grand Trunk railway, with headquarters at Toronto, Ont. He succeeds C. W. Power, resigned.

James J. Shanahan has been appointed as sales manager for the E. L. Essley Machinery Co., Chicago, for Michigan. With Mr. Gough, he replaces J. A. Richardson, resigned.

Max E. Duncan will sever his connection with the American Car & Foundry Co., St. Louis, April 1, to take a similar position with the Canadian Car & Foundry Co., Montreal.

Thomas F. V. Curran, president of the General Vanadium Co. of America, sailed recently from New York on the Mauretania for a month's business trip to England, France and Germany.

E. L. Cousins, engineer of the Toronto harbor commission, and J. G. Sing, Canadian government engineer, will make a two weeks' inspection tour of the principal harbors of the Atlantic coast.

S. C. Dunlop, who has been assistant engineer in charge of sewer construction at Charleston, S. C., has accepted a position on the engineering staff of the Lehigh Valley railroad with office at Geneva, N. Y.

F. W. Hutchins was elected a director of the Lake Superior Iron & Chemical Co. at the annual stockholders' meeting, succeeding Thomas McDougall, retired. Harry Moore was also added to the board.

H. E. Passmore, division master mechanic of the Toledo & Ohio Central railway, at Kenton, O., has been appointed division master mechanic of that road and the Zanesville & Western, with offices at Bucyrus, O.

D. W. Phillips, formerly gas engine designer for the Harder Automobile Truck Co., of Chicago, has been engaged as designer by the International Hoist Co., of Antigo, Wis., which concern will erect an entirely new plant this year.

F. William Hausman has resigned as chief mechanical engineer of the Sloss-Sheffield Steel & Iron Co., Birmingham, Ala., which post he had held for six years, and will engage in the mechanical engineering business at Birmingham.

C. E. A. Thompson, formerly connected with the Bridgeport Foundry & Machine Co., and the Bridgeport Deoxidized Bronze & Metal Co., Bridgeport, Conn., is now sales manager for the Millett & Harley Co., Springfield, Mass.

P. M. Wege, formerly superintendent of the General Fireproofing Co., Youngstown, O., is now forming a company to manufacture metal furniture. The plant is expected to be located in Grand Rapids, Mich. Mr. Wege lives in Marietta, O.

W. B. Taylor has been appointed division engineer of the Superior and Mesabi divisions of the Great Northern railway. He will have charge of the maintenance of way, a responsible post in view of the expected increase in ore shipments this summer.

H. G. Schowe, who was formerly secretary of the Bowler Foundry Co., Cleveland, O., is now secretary of the Meriam Co., Cleveland, sales agent for power plant equipment. His office is in the Younglove building, Euclid avenue and East Fifty-Fifth street.

H. L. Brinker has been promoted to the position of assistant superintendent of blast furnaces of the Ohio works of the Carnegie Steel Co. He had been chief chemist at the works for 12 years. He is succeeded in that position by Truman S. Woodward.

Charles E. Downton, of the Westinghouse Electric & Mfg. Co., lectured to seniors of the College of Engineer-

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ing of the University of Illinois recently. He set forth the advantages offered by his company in the matter of positions for technical graduates.

George Smith, who has been superintendent of the steel foundry department of the Londonderry Iron & Mining Co., Nova Scotia, has resigned to assume the position of superintendent of the Dutcher Works plant of the Prince Steel Co., Milwaukee, Wis.

S. W. Jameson, principal owner of the Interstate Mfg. Co., Oskaloosa, Ia., was recently re-elected secretary and manager of the plant, at a meeting of the board of directors. The company will enlarge its plant for the manufacture of the Marvel furnaces.

Walter G. Stringer has been appointed manager of the Philadelphia office of the Joseph Dixon Crucible Co., Jersey City, N. J. Mr. Stringer succeeds William J. Coane, who recently resigned to become third vice-president of the Ajax Metal Co., Philadelphia.

Arthur J. Harris will succeed his father, the late James Harris, as head of the Janesville Barbed Wire Works, Janesville, Wis., the largest independent wire works in the country. The elder Mr. Harris was the founder of the Janesville Machine Co. and other industries of Janesville.

Walter C. Hofer has opened engineering offices in the Colonial building, New Castle, Ind. Mr. Hofer is an expert on machinery and machine tool design and will furnish plans and specifications for industrial plants, machine shop lay-outs and power distribution in mills and factories.

R. H. Flaharty, formerly connected with the United States Steel Corporation and now head of the mining department of Mackenzie, Mann & Co., is investigating the iron ore deposits of British Columbia in connection with the project of establishing a steel plant at Port Mann.

B. E. Lovejoy, Redfield, S. D., is the new president of the South Dakota Society of Engineers and Surveyors. The other officers are J. L. Wagner, Sioux Falls, vice president; R. B. Easton, Aberdeen, secretary and treasurer; H. C. Leibee, Yankton, and S. B. Howe, Sioux Falls, directors.

Thomas Findlay, who has been assistant general manager of the Massey-Harris Co., agricultural implement manufacturer, Toronto, Ont., has been appointed vice president of the company. Sir Edmund Walker and E. R. Wood, prominent financiers of Toronto, have been added to the directorate.

Walter B. Snow, publicity engineer, 170 Summer street, Boston, has increased his organization by the addition of Chas. Mulligan, late of the editorial staff of the Brooklyn Standard Union and for a considerable period associated with the publicity department of the Western Electric Co.

A. P. Campbell, of St. Thomas, Ont., who has been for the past six years general manager of the Massey-Harris Co., of New Zealand, has been appointed general sales manager for the United States of the Massey-Harris Co., agricultural implement manufacturer, with headquarters at Batavia, N. Y.

Peter S. Roe, mechanical superintendent of the royal mint, Ottawa, has resigned, having been appointed superintendent of the irrigation works of the Okanagan Realty & Investment Co., with headquarters at Appledale, B. C. He will have charge of the electric power and light system of the district.

Heinrich Koppers, of Essen, Germany, head of the firm of H. Koppers, builder of by-product coke oven plants, who is in the United States on a business trip, expects shortly to visit the steel plants at Sault Ste. Marie, and later at Cleveland, O. At present he is a guest at the Congress hotel, Chicago.

Kenneth Duncan, who has been connected with the Pioneer mine, Vermillion range, for several years, has just been appointed general manager for the North American and Consolidated Vermillion Iron companies. Mr. Duncan is a graduate of the University of Minnesota and has had mining experience in the west.

Prof. J. G. D. Mack, of the University of Wisconsin, in a recent lecture before the faculty and students of the College of Engineering of the University of Illinois, appealed to the engineering students to study the history of engineering as well as current practices. He pointed out features of ancient engineering works.

Edward T. Adams, Milwaukee, Wis., president of the Wisconsin Engine Co., and Nisbet Latta, assistant to the president, who have been largely responsible for the development of the crude-oil gas producer, invented by H. A. Grine, of California, have now demonstrated their full faith in the invention and are about ready to place it on the market.

Price McKinney, of Corrigan, McKinney & Co., Cleveland, has gone to Mexico on business connected with his extensive mining operations in the troubled republic. Mr. McKinney says that the various revolutions in Mexico have not interfered seriously with his enterprises and neither he nor James Corrigan, who has also been in Mexico for a number of months, is afraid of being placed in danger personally.

J. B. Entz, James G. Sterling and H. B. Anderson were speakers Tuesday evening, March 26, before the Cleveland Engineering Society. They gave a "Symposium on the Automobile Motor." Mr. Entz, who is with the White Co., discussed "The Long-Stroke Motor"; Mr. Sterling, of the F. B. Stearns Co., spoke on "Valve Mechanisms"; and Mr. Anderson, of the Winton Motor Carriage Co., discussed "Motor Starting Devices".

John R. Buchanan, member and sales manager of the Appleton Wire Works, Appleton, Wis., will sever his connection with that concern April 1. With Joseph W. Perazzo, L. M. Peebles and Frank Haefs, he will organize a company for the manufacture of wire cloths and screens and will locate in Canada, probably the eastern section. The plant will start with ten looms. C. J. Gurnee, Grand Rapids, Wis., has been named as Mr. Buchanan's successor in Appleton.

C. H. Overkamp and **P. P. H. Conover** are the organizers of the Conover-Overkamp Machine & Tool Co., a new corporation of Dayton, O., which has just taken over the Miami Valley Machine Tool Co., of that city. Mr. Conover has been connected with the Miami Valley Machine Tool Co. since its organization and is well known to the machine-tool trade. Mr. Overkamp, the new member of the firm, has been connected with the machine-tool business for some years in Cincinnati and Canada and will attend to the designing, manufacturing and selling end of the business.

Lowest Prices in Eight Years On Lake Ores

Bessemers for the First Time Reduced More Than Non-Bessemers—Differential Against Mesabis Reduced to Five Cents

The announcement of new prices of lake ore usually comes as a surprise and this year was not an exception to the rule which has prevailed since associations and agreements were abandoned and an open market established. Last year, the selling of ore for the season was precipitated Friday, April 21, by the receipt of a telegram to *The Daily Iron Trade Review,* stating that the W. P. Snyder interests, of Pittsburgh, had sold 550,000 tons at a reduction of 50 cents from the prices of 1910. This made the price for 1911 as follows: Old range Bessemer, $4.50; Mesabi Bessemer, $4.25; old range non-Bessemer, $3.70; Mesabi non-Bessemer, $3.50.

SELLING PRICE OF IRON ORE AND PRICE OF PIG IRON AT DATE OF BUYING MOVEMENT.

Season.	Date Buying Movement.	Season Iron Ore Prices				Iron Prices, Valley.	
		O. R. Bess.	Mes. Bes.	O.R.non-B.	Mes.non-B.	Bess.	No. 2 Fdy.
1890	Dec. 15, 1889	$5.50	no sale	$5.25	no sale	$22.15	$18.15
1891	June 1, 1891	4.50	no sale	4.25	no sale	15.15	15.00
1892	Jan. 31, 1892	4.50	no sale	3.65	no sale	15.00	13.65
1893	March 15, 1893	3.85	$3.00	3.20	no sale	12.65	12.15
1894	March 1, 1894	2.75	2.35	2.50	no sale	9.65	9.65
1895	April 1, 1895	2.90	2.15	2.25	$1.90	9.40	9.40
1896	May 1, 1896	4.00	3.50	2.70	2.25	12.40	11.15
1897	May 20, 1897	2.60	2.25	2.15	1.90	8.35	8.40
1898	March 20, 1898	2.75	2.25	1.85	1.75	9.55	9.80
1899	Feb. 1, 1899	3.00	2.40	2.15	2.00	10.30	9.75
1900	Dec. 15, 1899	5.50	4.50	4.25	4.00	24.15	22.15
1901	April 15, 1901	4.25	3.25	3.00	2.75	16.15	14.40
1902	Feb. 1, 1902	4.25	3.25	3.25	2.75	15.90	15.90
1903	March 20, 1903	4.50	4.00	3.60	3.20	21.50	21.65
1904	April 15, 1904	3.25	3.00	2.75	2.50	13.35	13.15
1905	Feb. 1, 1905	3.75	3.50	3.20	3.00	15.50	16.00
1906	Dec. 5, 1905	4.25	4.00	3.70	3.50	17.25	17.25
1907	Nov. 10, 1906	5.00	4.75	4.20	4.00	21.50	21.50
1908	June 15, 1908	4.50	4.25	3.70	3.50	16.00	15.00
1909	May 10, 1909	4.50	4.25	3.70	3.50	14.75	14.25
1910	Dec. 24, 1909	5.00	4.75	4.20	4.00	19.00	17.25
1911	April 21, 1911	4.50	4.25	3.70	3.50	15.00	13.75
1912	March 20, 1912	3.75	3.50	3.05	2.85	14.25	13.25

In the preceding year also, Mr. Snyder, who is universally admitted to be one of the shrewdest merchants in the business, fixed the ore price, but this year it fell to the lot of an old, conservative Cleveland house to determine what should be the prevailing prices; that is, to determine prices as much as is possible for any one concern to do in an absolutely uncontrolled market which may prove to be uncontrollable. Last Wednesday, the news that a million and a half tons of ore has been sold on a basis of a reduction of 75 cents for old range and Mesabi Bessemer and 65 cents on old range and Mesabi non-Bessemer, leaked out and was made public by THE IRON TRADE REVIEW on Thursday. The announcement came as a distinct surprise to nearly everybody connected with the iron trade, including some of the leading ore sellers.

"We simply cannot understand it," said one ore seller. "The fact that the prices were made by an old conservative house which does not easily lose its head, shows that there is unusual cause for this drastic action. I am sure I do not know what that cause was. I cannot see that the deep cut was justified by existing conditions. I feel certain that the production from some mines, especially on the old range, will be sharply curtailed."

Last Year's Concessions

When closely examined, however, the reductions are not as important or as radical as they seemed at first glance. Announcement of the new prices has resulted in making public some facts not heretofore disclosed concerning what was done last year. While it was known that the regular or official prices were not adhered to, it was not suspected that competition was as keen as is now made clear. A leading ore seller said, Thursday:

"This ore cut is not as deep as it seems. Last year there was exceedingly keen competition and prices on some ores were made almost as low as those of the new schedule. Making pig iron now from ore whose average price is very low, many furnaces are selling at or below cost, and, owing to the fact that coke will in all probability be higher this year than it was last, or is now, it will be impossible for furnaces materially to reduce their costs. It would be well for buyers of pig iron to understand this fact and not to expect much in the way of concessions in prices from the furnaces."

Differential Disappears

One of the very interesting features of the new price schedule is that it practically wipes out the differential against the Mesabi ores. In the early days of Mesabi ores, furnace men were strongly prejudiced against them because of their fineness of structure and because it was believed that they were responsible for many slips. At first Mesabi ores were almost a drug on the market, and in 1893 the differential was 85 cents, as old range Bessemer sold at $3.85 and Mesabi at $3. In 1894 the differential was 60 cents and it varied from 35 to 60 cents for five years up to 1900, when it became $1 and continued at $1 in 1901 and 1902. In 1903, the differential was 50 cents and since that time it has been 25 cents. The new schedule still apparently preserves the 25-cent differential, but in reality it is only 5 cents because, on account of the reduction in freight rates on the Minnesota roads, Mesabi ores can be delivered at lower lake ports for 20 cents less than in past years.

These figures are based on the official quotations of base ores. In some cases, however, when the finer grained Mesabi ores were first coming on to the market, there was a spread of $1.25 in prices, in favor of the popular old range ores. In 1900, the differential between some high grade old range Bessemer and certain Mesabi ores of fine structure ranged from $1.40 to $1.90.

History of Ore Selling

Price concessions have been made every year from the official Lake Superior ore prices, but the new official schedule is the lowest announced since April 15, 1904, when the official old range Bessemer price was $3.25, compared with $3.75 this year; Mesabi Bessemer was $3, compared with $3.50; old range non-Bessemer was $2.75, compared with $3.05; and Mesabi non-Bessemer was $2.50, compared with $2.85.

On May 5, 1904, THE IRON TRADE REVIEW announced:

"The decision of the merchant pro-

ducers of Lake Superior ore to maintain no association this year and no agreement as to prices or output, while contrary to the expectation encouraged by many recent expressions from high sources, was not surprising to those who had been advised of the sentiment of the merchant firms. The action is not so significant as it would have been two months ago, for, in the meantime, term contracts involving considerable amounts of ore have been negotiated, leaving not more than 3,000,000 tons to be bought in the open market this year."

In the Cleveland market report, May 3, 1904, it was noted that "for the first time in ten years the producers of Lake Superior ores entered the selling season without any agreement as to prices. It was then stated that the need of an association apart from statistical purposes is not likely to be again what it has been previous to this year."

This prophecy has turned out to be true, and never was there so little cooperation as there has been this year. Nothing has been done by any of the ore sellers which could possibly be twisted by the most enthusiastic "trust-

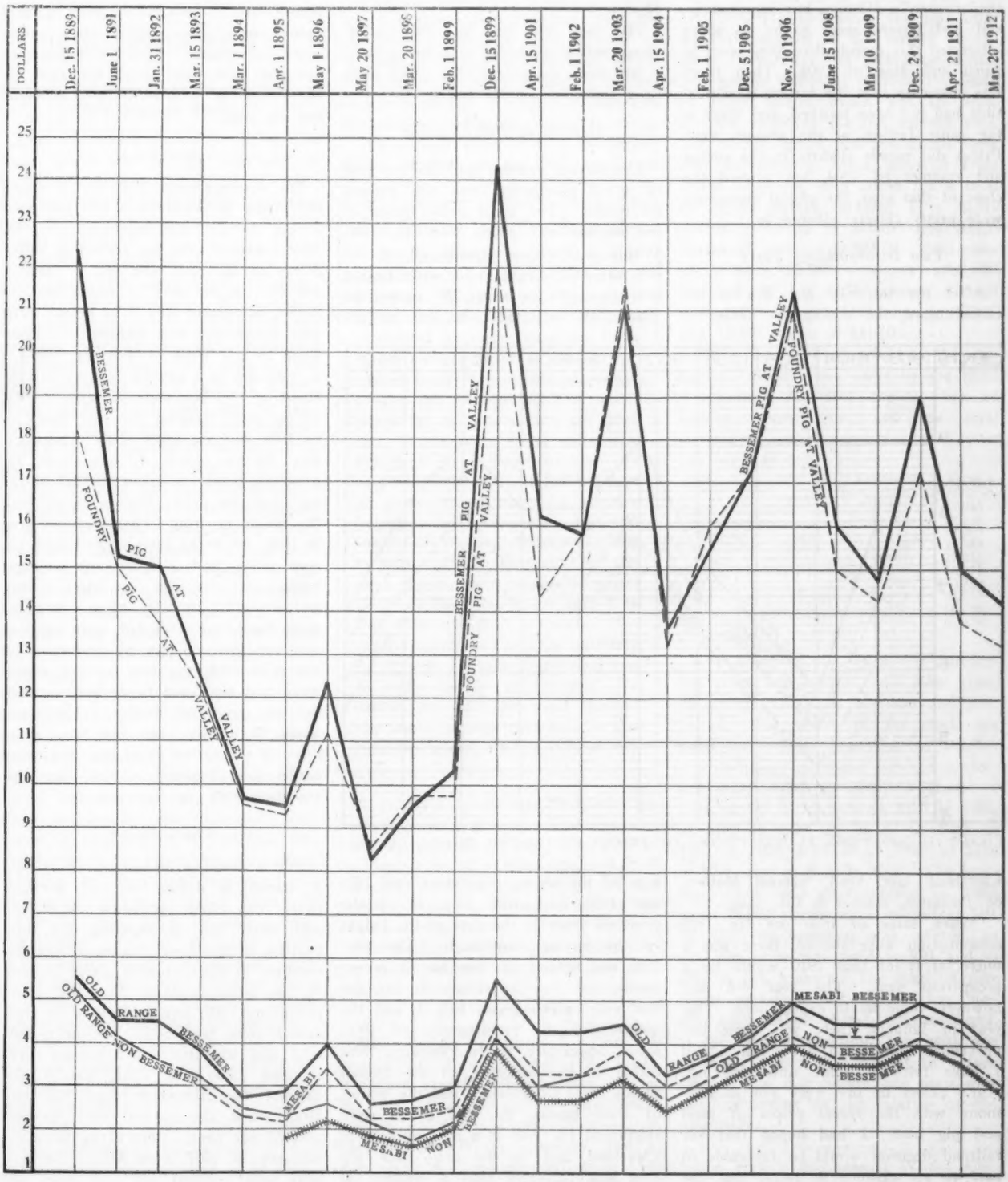


CHART I—FLUCTUATIONS OF PRICES OF IRON ORE AND BESSEMER AND FOUNDRY PIG IRON PER TON FROM 1889 TO 1912

buster" into a violation of the anti-trust laws.

In 1904, in the Cleveland market report of May 10, it was stated that "there have been some preliminary negotiations this week between sellers and consumers of ore, but very little progress has been made, as nearly all furnaces have supplies which will meet their requirements for several months, apart from possible shortage on particular ores." History has repeated itself and buyers seem to be no more interested this month than they were in April and May of 1904. Then there was suspicion that the lowest level possible had not been touched, and there is the same feeling at the present time. Prices did recede slightly in the spring and summer of 1904, but toward the close of that year, the official quotations were pretty closely adhered to.

Two Disappointing Years

After the sales by Mr. Snyder became known, the leading ore dealer of Cleveland, last April, Samuel Mather, of Pickands, Mather & Co., said:

"When sales of iron ore for 1910 consumption were started, there was a universal belief that 1910 would be a prosperous year. The year did not, however, come up to expectations. This year in January, there was some improvement, but it did not continue and I have felt for some time that last year's prices of ore were not in harmony with the recent prices of steel and pig iron. I had hoped that the railroad decision would be favorable in part to an advance in rates, that the decisions of the United States supreme court on important cases would soon be handed down, and that there would be no more agitation in congress; but on all of these points there has been disappointment, and I think it is entirely proper to reduce the price of ore. We shall sell our ores at a reduction of 50 cents, not because Mr. Snyder has done so, but because it is in harmony with our own judgment. Mr. Snyder's action has, however, naturally hastened the beginning of the selling of ore."

The past year was like 1910 in its disappointing features, and for months it has been recognized that there must be a reduction in ore prices.

History of Past Seasons

The buying season for 1907, a year of great prosperity, was the earliest on record. The most active point of the market was about Nov. 10, 1906. Within a week, practically all of the ore was sold. Next to the early buying movement of the year 1907, came the years 1906, with Dec. 5, 1905, as the date of the buying movement, and 1890 and 1900, each with Dec. 15 of the previous years as the date of the height of the buying movements. The year 1905 was notable for two buying movements, one for the supply of ore for that year, which began Feb. 1, and the second for the requirements of 1906, which began Dec. 5. In February, 1908, owing to the influence of the United States Steel Corporation and the wishes of some buyers, the 1907 prices were reaffirmed for 1908 at a meeting held in Cleveland, and, at the same time, pig iron manufacturers held a meeting at which it was decided to endeavor to maintain a basis of $17, valley, for No. 2 foundry iron. The market continued to drag, however, and on June 15 ore prices were reduced 50 cents. The buying movement then started, being the latest on record.

In 1909 many reservations were made during the early months, and there was a little actual buying, but prices were not really determined until May 10. In 1910, all the Bessemer ore available was reserved before prices were established, and reservations were quickly turned into actual sales when prices were announced. Some non-Bessemer ore also was sold early, but sales of the remaining tonnage dragged throughout the year.

Chart No. 1

The accompanying chart No. 1 shows the prices at which iron ore has sold during the 22 years beginning Dec. 15, 1889, together with the prevailing valley prices of Bessemer and No. 2 foundry pig iron at the date at which the ore buying movement was at its height. The idea, which was first embodied in chart form in our issue of Feb. 21, 1907, is to establish in a graphic manner the relation of the raw material price to that of pig iron. During the past years up to 1909, barring some slight irregularities, the two series of lines have approached nearly to being parallel, showing that ore prices have declined with the prices of iron. This was not true in 1909, when the lines representing pig iron prices had a downward tendency while those for iron ore prices continued straight. In 1910, when ore prices were fixed, the lines for both pig iron and ore had an upward tendency, but later, in 1910, pig iron started downward and continued to decline throughout the year, the decline in Bessemer being $4. This year and last, as in most of the earlier years, the downward tendency is common to the lines representing both pig iron and ore.

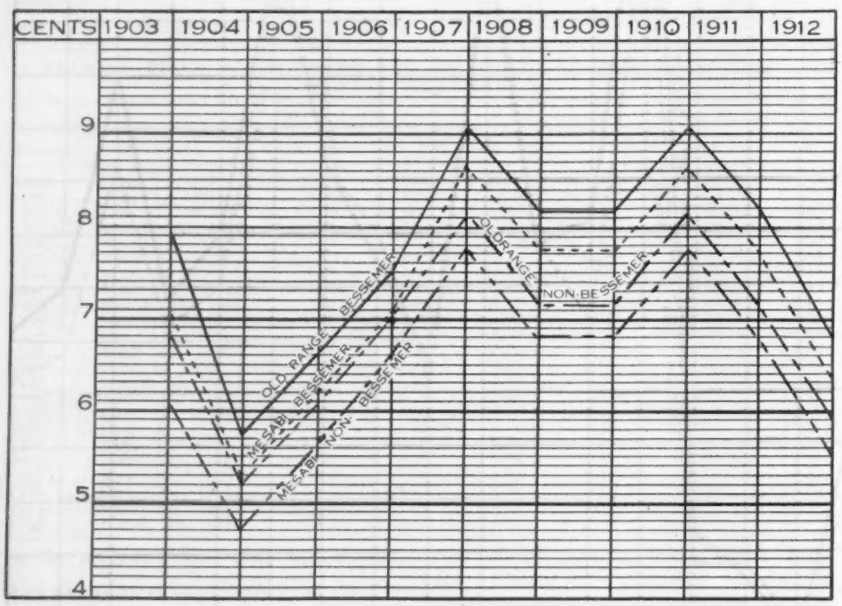


CHART II—SHOWING FLUCTUATIONS OF PRICES BY UNIT OF IRON, NATURAL

Chart No. 2.

For a number of years, chart No. 1, which is drawn on the tonnage basis, has been published. We now add chart No. 2, showing the fluctuation in the four classes of ore according to the value of units of iron in the natural state. For the years preceding 1907, the guarantee of Bessemer ores was 56.70 per cent natural and for the non-Bessemer ores it was 52.80 per cent, except for Mesabi non-Bessemer for 1905 and 1906, when the natural iron content was 53 per cent. Before the sales for delivery in 1907 were made, the natural iron content for the base was changed to 55 per cent for the Bessemers and 51.50 per cent for the non-

Bessemers. The fluctuations in unit prices have been as follows:

	—Old Range—		—Mesabi—	
	Bes'm'r. cents.	Non-B. cents.	Bes'm'r. cents.	Non-B. cents.
1903.....	7.94	6.82	7.35	6.06
1904.....	5.73	5.21	5.29	4.73
1905.....	6.61	6.06	6.17	5.66
1906.....	7.50	7.01	7.05	6.60
1907.....	9.09	8.16	8.64	7.77
1908.....	8.18	7.18	7.73	6.80
1909.....	8.18	7.18	7.73	6.80
1910.....	9.09	8.16	8.64	7.77
1911.....	8.18	7.18	7.73	6.80
1912.....	6.82	5.92	6.36	5.53

Fluctuations of iron ore prices expressed in values of units of iron in natural state.

IRON ORE DEPOSITS

Furnish Sensational Writers a Subject —The Known Facts.

The sensational announcement in the many newspapers of the discovery of a "billion"-ton iron ore deposit in Pennsylvania has attracted more attention than it deserved, but the known facts are of interest.

The fact is that the "discovery" has been known for some time. The deposit is in Fulton county, Pennsylvania, a remote and isolated region in the southern part of the state bordering on West Virginia. To indicate the inaccessibility of the locality, it is sufficient to note that there are no railroads in the county in which this deposit exists. The ore is found in the Blue Ridge "belt", which extends through Virginia and into Pennsylvania. Geologically, it is a direct continuance of the Blue Ridge formations in which are found the "Mountain" brown ores which occur along the flanks at the base of the sand stone or quartzite ridges extending along the west slope of the Blue Ridge from near Fort Royal in Warren county, Virginia, to a point south of Roanoke and along the east side of the New River-Cripple Creek district, in Pulaski county and along and near to the Wythe-Carroll counties boundary.

Bulletin No. 6 of the Virginia Geological Survey says that, "These Virginia ore deposits are associated with Cambrian quartzite or its residual material, usually the latter, showing great variation in form and texture, and ranging in iron content from 35 to 50 per cent and in silica content from 10 to 30 per cent, with usually high manganese and phosphorus. They are of lower grade than the valley or limestone brown ores, and are regarded as concentrations by meteoric water, the iron having been derived largely if not entirely from the overlying shale and limestone formations."

No definite information has been given out concerning the geology of the Fulton county deposit, but it is likely that it will conform to the type of these Virginia ores, as it is in the same geological province. The Virginia deposits are extensive, being in the nature of bedded deposits. They are irregular in thickness and vary greatly in grade and character. They are mostly hematite and limonite and carry considerable phosphorus, enough to place them in the non-Bessemer class. Manganese occurs with these ores and as separate, commercially important, deposits in the same formation.

It is reported from parties interested in the Fulton county discovery that the ore is hematite and that part of it, at least, is Bessemer grade and all of it reported to carry a higher content of iron than that attributed to the Virginia deposits of probably similar origin.

The deposit is controlled by certain strong interests in the iron trade not now prepared to disclose their identity. It can be said that the United States Steel Corporation is not interested in the deposit or its development and it is expected that the greater part of the probable deposit is entirely controlled by these new interests.

The exploration has been under way for some months and will be continued.

Our Annual Iron Ore Statistics

The pamphlet containing our annual iron ore statistics is now ready for distribution. The pamphlet contains statistics of shipments of iron ore from the Lake Superior region by mines and ranges for 1911 and the preceding years; ore receipts of Lake Erie ports for six years; ore on dock Dec. 1 and May 1, for six years; prices of Lake Superior iron ore and Bessemer pig iron for the past 22 years; chart showing relative improvement of the different ranges, as to production, from 1890 to 1911; iron ore imports for the past three years; and shipments of ore to furnaces from May 1 to Dec. 1 for the past 11 years.

This pamphlet will be sent free to all who furnished information to assist in its compilation. To others it will be sent for $1 per copy, postage prepaid, by the Penton Publishing Co., Cleveland.

Will Build Foundry.—A plot of ground at Twenty-third and West Moreland streets, Philadelphia, 187 x 395 feet in dimensions, has been bought by Edward W. Bureau, of Bureau Bros., brass founders, and a new plant will be erected upon the site. This will consist of a foundry, finishing shop and office building.

EMPLOYES RESPOND

As Never Before in Subscribing for Corporation Stock.

An interesting study of the manner in which the employes of the United States Steel Corporation have responded to offers of stock subscription is available through the official figures covering the subscriptions for 1912, which have just been made public. The subscriptions received under the 1912 offer were the largest in the history of the Steel Corporation, as previously stated, and greatly exceeded in total the block of 25,000 shares which was set aside for the employes for the current year. The official figures just announced show that subscriptions were received from 36,946 employes, who asked for a total of 61,354 shares, divided into 30,619 shares preferred at $110.00 and 30,735 shares of common at $65.00. This compares with 26,363 employes subscribing in 1911 for 48,348 shares, divided into 29,119 shares of common at $70.00 and 19,229 shares at $114.00.

Since the offer of stock to the employes was first announced by the Steel Corporation in 1902, the number of employes subscribing and the total amount of stock asked for each year has been as follows:

Year.	Employes Subscribing.	Total Subscrip'ns.
1903.....	27,379	48,983
1904.....	10,248	32,519
1905.....	8,429	17,963
1906.....	12,256	23,989
1907.....	14,169	27,032
1908.....	24,884	50,075
1909.....	19,192	*40,700
1910.....	12,444	24,672
1911.....	26,363	48,348
1912.....	36,946	61,354

*Estimated.

For the first six years only preferred stock was offered, and since then, excepting 1910, both common and preferred. The prices of the stock are fixed each year, according to market conditions. The prices for the preferred were fixed at $82.50 a share in 1904, at $87.50 in 1905, at $100 in 1906, at $102 in 1907, at $87.50 in 1908, at $110 in 1909, at $124 in 1910, at $114 in 1911, and at $110 in 1912. The common stock was first offered in 1909, when 15,000 shares were offered at $50. In 1910 no common was offered, in 1911 the price was fixed at $70, and in 1912 at $65, a share. The total offering either preferred or common has usually been 25,000 shares annually, and, as the total subscriptions have with one or two exceptions exceeded the stock offered, the distribution has been prorated according to the salaries of the subscribers.

The Hanna Engineering Works, Chicago, has let the general contract for an addition to its plant, to cost $15,000.

Indictments Against Individuals Are Quashed

And Companies Fined in the Dock and Railway Rebating Cases in United States Court—Guilt of Hanna Concerns Technical

In concluding his statement to Judge Killets, Attorney Rush C. Butler made this important statement in a very impressive manner:

"It is upon this state of facts that the indictment against the individual defendants is justifiably nolled by the government. It is also upon this state of facts that the Pennsylvania Co. under advice of counsel is now constrained to enter its plea acknowledging a technical violation of the Elkins act, and that the Ohio & Western Pennsylvania Dock Co., under like advice, and in order to terminate this criminal proceeding in an amicable manner, enters its plea of NOLO CONTENDERE, *vigorously denying its guilt as well as the willful or intentional wrongdoing of any of its officers or agents. It is emphatically asserted by all these defendants that there was no purpose or intention to do wrong to any person or injustice to any locality, and it is even more emphatically maintained that the liberal provisions of the contract in question were in furtherance and not in contravention of the general purpose of the act to regulate commerce. And in this view we are pleased to know the high officials of the United States government, charged with the duty of enforcing the act, concur."*

The acceptance by the government of pleas of nolo contendere by the eight railroad and dock companies involved and the quashing of the indictments returned against Dan R. Hanna and R. L. Ireland, of the M. A. Hanna & Co., and D. T. McCabe, of the Pennsylvania Co., together with the imposition of fines aggregating $123,000, brought to a close Saturday, March 23, the government's suit, begun a year ago, against certain ore-handling railroad and dock companies and individuals on charges of rebating and conspiring to rebate.

The hearing was held in the district court at Cleveland before Judge John M. Killets and the decision to accept the pleas of nolo contendere and the dismissal of the cases against the individuals, followed the receipt of a recommendation from Interstate Commerce Commissioner Franklin K. Lane, and endorsed by Attorney General George W. Wickersham, that such a procedure be followed. Mr. Lane wrote that he believed in this manner full justice would be done.

The individuals were cleared of any imputation of guilt by Commissioner Lane, who made his recommendation on the result of an exhaustive investigation conducted by the commission. He expressed the belief that the individuals sought by the payments from the excess earnings of the dock companies to correct the discriminations growing out of the leasing system, which were technical violations of law in as much as the returns were not listed in the published tariffs, but that the persons indicted were not responsible for the evils which had grown up under that system.

The agreement as to the amount of the fines to be imposed was reached after an extended conference in the office of United States District Attorney U. G. Denman, at which the railroads, dock companies and individuals were represented by counsel. A number of the counts against the companies were dropped and the fines imposed on the pleas on the other counts.

Fines Imposed

The Pennsylvania Co., $20,000 for rebating and $10,000 for conspiracy to rebate. Total, $30,000.

The Lake Shore & Michigan Southern Railway Co., $15,000 for rebating and $5,000 for conspiracy. Total, $20,000.

The Bessemer & Lake Erie Railroad Co., $20,000 for rebating and $10,000 for conspiracy. Total, $30,000.

The New York, Chicago & St. Louis Railroad Co., $3,000 for rebating.

The Ohio & Western Pennsylvania Dock Co., $10,000 for conpiracy.

The Union Dock Co., $7,000 for conspiracy.

The Ashtabula Dock Co., $6,000 for conspiracy.

The Pittsburgh & Conneaut Dock Co., $7,000 for conspiracy with the Lake Shore & Michigan Southern Railway Co., and $10,000 for conspiracy with the Bessemer & Lake Erie Railroad Co. Total, $17,000.

Total of fines imposed, $123,000.

The United States Steel Corporation was fined $47,000 through its ownership of the Bessemer & Lake Erie Railroad Co. and the Pittsburgh & Conneaut Dock Co. The railroad was fined $20,000 for rebating and $10,000 for conspiracy to rebate, while the dock company was fined $10,000 for conspiracy with the Bessemer & Lake Erie Railroad Co., and $7,000 for conspiracy with the Lake Shore & Michigan Southern Railway Co. The other fines were as follows: The Pennsylvania Co., $20,000 for rebating, and $10,000 for conspiracy to rebate; the Lake Shore & Michigan Southern Railway Co., $15,000 for rebating and $5,000 for conspiracy; the New York, Chicago & St. Louis Railroad Co., $3,000 for rebating; the Ohio & Western Pennsylvania Dock Co., $10,000 for conspiracy; the Union Dock Co., $7,000 for conspiracy, and the Ashtabula Dock Co., $6,000 for conspiracy.

The indictments were returned a year ago as a result of an investigation by the Interstate Commerce Commission of the practice of the companies involved in returning certain allowances to shippers, the money being derived from the excess earnings of the dock companies.

The government at the conference preceding the session of court, was represented by District Attorney U. G. Denman, Assistant United States Attorney Joseph Fogg and S. H. Smith, on behalf of the Interstate Commerce Commission and the department of justice. The others present were Rush C. Butler, Chicago, representing Messrs. Hanna and Ireland, the Ohio & Western Pennsylvania Dock Co., D. T. McCabe and the Pennsylvania Co.; R. F. Grant, counsel for M. A. Hanna & Co.; C. D. Heiserman, Pittsburgh, general solicitor of the Pennsylvania Co.; S. H. Tolles, coun-

sel for the Lake Shore & Michigan Southern Railway Co.; Andrew Squire, counsel for the Pennsylvania Co. and the Bessemer & Lake Erie Railroad Co.; H. H. McKeehan, counsel for the Union Dock Co. and the Ashbula Dock Co.; Frank B. Carpenter, counsel for the New York, Chicago & St. Louis Railroad Co.; Samuel H. West, counsel for the Lake Shore & Michigan Southern Railway Co.

Immediately upon the opening of court, the pleas of nolo contendere were entered by the representatives of the companies. A number of the counts against the Lake Shore & Michigan Southern Railway Co., the Bessemer & Lake Erie Railroad Co., and the New York, Chicago & St. Louis Railroad Co., were nolled.

Mr. Denman read to the court a letter from Attorney General Wickersham, endorsing and enclosing the recommendation from Commissioner Lane, which was also read. Mr. Lane in substance wrote that he believed the imposition of fines against the railroad and dock companies and the dismissal of the cases against the individuals would best satisfy justice. After reciting the points covered by the indictments, he stated that the negotiations which had been carried on for some time between the commission and the companies had determined that in the future the railroads would operate the docks and might employ agents, who were not consumers of ore. He expressed the belief, formed as a result of the commission's investigation, that the individuals indicted had striven to correct the abuses of the leasing system and could not be held responsible for the evils which had grown up and had now been done away with.

Mr Wickersham, in his letter, read to the court, endorsed the findings and recommendations of Commissioner Lane.

Attorney Butler then gave the following resume of the practices that had led to the indictments:

Mr. Butler's Address

"On behalf of D. T. McCabe, Dan R. Hanna, R. L. Ireland, the Pennsylvania Co., and the Ohio & Western Pennsylvania Dock Co., the defendants in case No. 3458, indicted under section 5440 for conspiracy to violate the Elkins act, and on behalf of the Pennsylvania Co., defendant in case No. 3465, indicted for violation of the Elkins act, I desire briefly to call to the court's attention the history of the handling of ore over Lake Erie docks, with particular reference to the relationship between the Pennsylvania Co., its docks, and shippers of ore over its docks via its lines. A knowledge of these conditions is necessary to a fair consideration of the specific facts upon which the indictments are based.

"As early as the year 1890, certain shippers of ore over other lines than those of the Pennsylvania Co. had associated themselves together, as they had a right to do, either in co-operative companies or by the organization of corporations for the more satisfactory handling of ore over docks at Lake Erie ports and for the enjoyment of the net profits arising therefrom. These arrangements, while not contrary to the provisions of any law on the statute books as then interpreted, necessarily created preferences in favor of the shippers of ore who were parties thereto. Shippers of ore via the Pennsylvania lines enjoyed no such preferences, as the Pennsylvania Co.'s docks were operated by contractors who were not shippers of ore. This discrimination against its ore shipping patrons caused the Pennsylvania Co. to announce on May 1, 1891, by a public circular addressed to "Consumers of Iron Ore", that in order to place consumers of ore moving via its docks on an equality with consumers of ore passing over the docks of other lines via Lake Erie ports, the Pennsylvania Co. would thereafter cause to be divided among all consumers of ore whose shipments were handled over its docks the net profits which might arise from the operation of such docks, the division of such profits to be in the ratio that the number of tons handled and transported over the Pennsylvania Co.'s lines for each consumer bore to the total tonnage so handled. The notice of May 1, 1891, was given wide distribution among shippers and consignees of ore throughout the entire territory reached by the Pennsylvania and other lines from Lake Erie ports, so that all consumers of ore were fully advised that if their ore passed over the docks of the Pennsylvania Co., not only would there be no discrimination by the Pennsylvania Co. as between any shippers of ore over its own lines, but also that the discrimination theretofore existing in favor of the certain ore shippers enjoying the profits of the operation of docks belonging to other cariers would be reduced to a minimum. The policy announced by the Pennsylvania Co. in the published notice of May 1, 1891, has been consistently followed up to the present time and, so far as it was within the power of the Pennsylvania Co. so to do, the ore which has passed over its docks has been kept upon an equality with the ore passing over the docks of other carriers at Lake Erie ports.

Wonderful Increase of Tonnage

"The first ore delivered by vessels at Lake Erie ports was unloaded by shoveling it into tubs or half barrels in the hold of the vessel, then hoisting the tubs or half barrels by horse power, dumping the ore into wheelbarrows at the vessel's side and wheeling it to the cars or to storage piles on the docks. As years passed by, the receipts of ore at the docks of the Pennsylvania Co. grew from 22,000 tons in 1862 to nearly 800,000 tons in 1890, and to more than 3,000,000 tons in 1907. This tremendous increase in ore tonnage was necessarily accompanied by an evolution in ore-handling machinery; so that, whereas in 1890 it required four or five days' time to unload a vessel carrying 3,000 tons of ore, at the present time a vessel carrying 10,000 tons of ore can be unloaded in four or five hours.

"The profits from the operation of the docks arise from two sources: First, the vessel unloading charge, meaning thereby the amount paid by the vessel for lifting the ore from the hold and carrying it to the vessel's rail; and, second, the charge paid to the dock company by the railroad company for transporting the ore from the vessel's rail and placing it either directly on the car, or first onto the dock for temporary storage and later onto the car. During the period under consideration, that is, from 1890 up to the present time, the amount collected by dock companies from vessels for unloading has varied from 13½c to 22c per ton, the usual charge being 20c. The customary charge by dock companies to rail carriers for carrying the ore from the vessel's rail to on board cars, whether direct or via the dock, was 20 cents per ton. The aggregate charge of the dock company, therefore, against the vessel and the rail carrier varied during this period from 33½ cents to 42 cents per ton. During the years 1908 and 1909 the dock company's charge to vessels was 20 cents and to the rail carrier 20 cents, making its aggregate charge during these years 40 cents per ton.

Figuring on Profits

"At about the time the circular of May 1, 1891, was issued by the Pennsylvania Co., careful calculations were made by the company based on its past experiences as to the net profits arising from its dock operations, and it was ascertained that, taking one season with another, there was a net profit to the dock company of

about 12 cents per ton on direct ore, that is, ore handled directly from vessels to railroad cars and forwarded at once to destination, and a net profit of about 5 cents per ton on dock ore, that is, ore on which immediate forwarding from the vessel was not desired by consumers and which consequently had to be unloaded and stored on the dock and later on at the convenience of the consumer reloaded onto railroad cars and forwarded to destination. Accordingly, beginning May 1, 1891, the Pennsylvania Co. began paying currently, that is, monthly, to consumers of ore handled over its docks allowances of 12 cents per ton on direct ore and 5 cents on dock ore, which were in the nature of rebates on the freight rate paid by consumers. These allowances were made to all consumers of ore without preference or distinction, and insured exactly equal treatment to all patrons of the Pennsylvania Co. The payment of these allowances was subsequently published in the tariffs of the Pennsylvania Co. and was continued from May 1, 1891, up to the first day of August, 1909. All other carriers reaching Lake Erie ports, it is understood, made the same allowances to all consumers on their lines; but some of the carriers in addition to making such allowances, in order to secure the efficient management of their docks permitted certain consumers of ore to operate the docks and reap the benefit of the net profits arising from such operation, to which we shall now refer.

Inequality Explained

"For several years after May 1, 1891, the allowances of 12 cents and 5 cents per ton above referred to represented approximately, if not actually, the net profits of the dock operations; but, beginning perhaps as early as the year 1905 or 1906, the increased tonnage handled over Lake Erie docks, together with the improvement in ore-handling machinery, caused the accumulation of additional surpluses or net profits at the end of each year after paying the 12-cent and 5-cent allowances. In other words, the profits of the dock operations began at about this period to exceed the allowances of 12 cents on direct and 5 cents on dock ore which all carriers had been paying to shippers via their respective lines. In the case of the Pennsylvania Co., all such additional surpluses or net profits went into the treasury of that company. In the case of some of the other carriers, such surpluses or net profits went to the dock companies. Therefore, consumers of ore whose shipments passed over the docks of the Pennsylvania Co. were no longer on an equality with consumers who were interested in dock companies on the lines of some of the other carriers.

Distributing Profits

"Being desirous of distributing the *entire* profits of its dock operations ratably among the consumers of ore on its lines and in pursuance of its long continued policy that ore shipments handled over its docks should be on an equality in so far as it was within its power so to make them with ore shipments handled over the docks of other carriers, the Pennsylvania Co. entered into a contract effective April 1, 1908, by the terms of which the Ohio & Western Pennsylvania Dock Co. was to operate the docks of the Pennsylvania Co. at Lake Erie ports. By the terms of this contract, the dock company was required to distribute ratably among all consumers of ore on the Pennsylvania lines the entire profits of the operation of said docks during the existence of said contract, and this in *addition* to the published tariff allowances of 12 cents on direct and 5 cents on dock ore, which the company also required the dock company to pay. It was obviously impossible to ascertain until after the close of any one year what the exact amount of such net profits would be. This rendered it impossible for the Pennsylvania Co. to state in its published tariffs the exact amount that would be repaid to consumers.

"It was believed by the officers of the Pennsylvania Co. that in making such an arrangement for the distribution of the profits of its dock operations, the broad spirit of the provisions of the act to regulate commerce was being carried out, as such an arrangement guaranteed to every consumer whose ore passed over the docks of the Pennsylvania Co. that he would be treated with strict impartiality whether his shipment amounted to one carload or hundreds of carloads. Publicity of this contract and of its contents was assured by the fact that the compensation of the dock company was upon a per ton basis, and it is not at all probable that there was a shipper or consumer of ore in the entire territory reached by the lines of the Pennsylvania Co. who was not fully aware of the new arrangements made for the distribution of those net profits. Counsel advised that it was not necessary to make reference in the tariffs of the Pennsylvania Co. to the proposed disposition of the possible surplus; that the rights under which the law of each individual consumer of ore were properly and legally safeguarded, and unjust discrimination of every character absolutely avoided.

"The indictments returned in this court against the Pennsylvania Co. and the Ohio & Western Pennsylvania Dock Co. are predicated upon payments made to consumers of ore of the net profits of dock operations from April 1, 1908, to August 1, 1909, as provided by the terms of the contract referred to. The indictment against D. T. McCabe, Dan R. Hanna and R. L. Ireland was returned because of the fact that their signatures appeared upon the contract, Mr. McCabe signing on behalf of the Pennsylvania Co., Mr. Hanna on behalf of M. A. Hanna & Co., and Mr. Ireland as a witness to Mr. Hanna's signature."

Mr. Butler then concluded with the paragraph given at the beginning of this article.

Andrew Squire, attorney for the Bessemer & Lake Erie Railroad Co., presented its case and defended the course pursued.

Judge Killets then accepted the pleas of nolo contendere and imposed the fines which were apportioned on a basis of $20,000 for each railroad and $20,000 for the dock companies. The cases against the Angeline Dock Co. and the Mahoning & Shenango Dock Co. were quashed as these companies had been dissolved before the return of the indictments.

"Are there any further orders which you wish entered in these cases, gentlemen?" inquired Judge Killets.

District Attorney Denman smiled as he said, "only that the fines be paid."

Nobody seemed worried about that little matter and court adjourned. None of the individual defendants was present in person nor was any railroad official.

Locomotives Ordered.—New locomotive orders continue to come in quite freely. The Baldwin Locomotive Co. announces the receipt of additional orders calling for 80 locomotives, including 50 for the Texas & Pacific railroad, 10 for the International & Great Northern, five additional for the Chicago, Great Western and 15 scattering. In addition, the company has received orders for electric locomotives.

H. Dupuis, of the Fleming, Dupuis Supply Co., Chaudiere, Can., is interested in the proposed construction of a $1,000,000 cement works near Hull, Que.

LIVE MACHINERY NEWS

In New York, it is understood that final action has been taken on the list of machine tools for the proposed technical high school in Jersey City, N. J.; no written contracts, however, have yet been signed. It is believed that the Jersey City school authorities will inquire for additional machinery to have an approximate value of about $50,000. A large amount of power plant equipment is now being figured on in the New York market. Some machinery for export is also being purchased by New York dealers. In Pittsburgh, a number of fair-sized orders have recently been placed with machinery dealers, and inquiries are somewhat more brisk. In Cleveland, there is an entire absence of important inquiries, but business in small lots continues fair. Some inquiries for mining equipment are expected out in that market very shortly. In Chicago, the demand for power plant machinery and equipment is especially active. Chicago dealers are still figuring on various pending railroad lists.

Machine Tools

N. Harrnan & Son, Antwerp, O., are planning to erect a new brick and frame machine shop, 24 x 60 feet.

The shops of the Denver & Rio Grande railroad, at Denver, Colo., are to be enlarged. No details have yet been made public.

The Baltimore & Ohio Railroad Co. expects to enlarge its shops at Garrett, Ind., and also to build a new round house and turntable and install considerable new machinery. A. W. Thompson, Baltimore, is general manager.

The Kropp Forge Co., Chicago, located on Twenty-second street, near Western avenue, has succeeded the firm of Sundberg-Kropp & Co. This concern is contemplating extensive additions. The two-story brick building, 66 x 125 feet, adjoining its present shop, will be fitted up as a machine shop and considerable new equipment will be needed. Charles A. Kropp is president and general manager.

Although written orders have not yet ben received by successful bidders on the $75,000 list of machine tools and other equipment put out by the Jersey City, N. J., school authorities early last month, it is understood that final action has been taken. It is understood that inquiries will also be submitted for about $50,000 worth of machinery for the new Jersey City technical high school.

Water Works

Plans have been prepared for a 5,000,000-gallon pumping station to be installed at Benton Harbor, Mich.

The city of Belleville, Wis., is in the market for a triplex pump, driven by a gasoline engine.

The Volunteer State Phosphate Co., Centreville, Tenn., is to construct a large pumping station for the purpose of increasing the capacity of its hydraulic mining plant. About $25,000 will be spent in making improvements.

The city council, South Bend, Ind., will soon let a contract for furnishing and installing two pumps of 5,000,000 gallons daily capacity, together with three 300-horsepower boilers. Burns & McDonnell, Kansas City, Mo., are consulting engineers.

The water commission of Manitowoc, Wis., has commissioned Arthur J. Morgan, Chicago, Ill., to prepare plans and specifications for increasing the water supply approximately 35 per cent. A new pumping engine will be included in the requirements.

Improvements to the waterworks at Moline, Ill., are contemplated, including the installation of a new 4,000,000-gallon, horizontal, compound, pumping engine and a 5,000,000-gallon turbine pump, which, it is estimated, will cost $19,000 with piping and connections; also three boilers to cost $6,000 and a new chimney to cost $3,500.

Power Plant Equipment

The city of Jackson, Mich., is in the market for two 125-horsepower boilers.

Quotations on a 30-horsepower gasoline engine are being asked by the Cromwell Milling Co., Cromwell, Ky.

Woodbury, N. J., is considering the installation of a municipal electric lighting plant.

The Penn Central Light & Power Co., Altoona, Pa., has commenced construction work on an addition to its plant.

The Colorado Springs & Interurban Railway Co., Colorado Springs, Colo., will install a 1,250-kilowatt, high pressure, turbo-generator this spring.

The county commissioners, Worcester, Mass., contemplate the installation of an electric lighting plant at the county jail.

New Castle, Pa., is considering the erection of a municipal electric lighting plant. The estimated cost is $133,000.

The Pawtucket Power & Electric Co., Pawtucket, R. I., will erect a large steel power house in that city. The erection contract has been let.

A vote will be taken by the taxpayers of Sharon on a bond issue of $85,000 for the construction of a municipal electric light plant.

R. E. Smith, Ruskin, Tenn., is in the market for a 75 - horsepower boiler to be installed in the plant of Ruskin Cave college.

The Public Service Corporation of Northern Illinois, Chicago, is reported to be preparing to rebuild its electric light plant at Havana, Ill.

Frazer & Bush, Lexington, Ky., have been awarded a contract for the equipment of a $10,000 electric light plant for Falmouth, Ky.

A franchise has been granted to J. J. Benner, Paw Paw, Ill., to construct and operate an electric light plant. A 24-hour service will be established.

Andrew Kidd Jr., consulting engineer, 95 Liberty street, New York, is preparing plans for increasing the capacity of the power plant of the Burden Iron Co., at Troy, N. Y.

The Seager Engine Works, Lansing, Mich., will install an electric light plant at Leitchfield, Ky. A franchise for the operation of the plant will be sold by the city.

J. H. Phelps, Jamestown, Ky., who is erecting a roller mill, is in the market for a limited amount of power machinery. The plant is to begin operations in 60 days.

The Pineville, Ky., Lumber & Mfg. Co., Pineville, Ky., will erect a planing mill, and will be in the market for a boiler, engine and wood-working machinery. Ben R. Smith, R. W. Johnson and C. J. Johnson are inter-

ested. The company has $10,000 capital.

The Booneville Light & Power Co., Booneville, Ky., is planning the erection of an electric plant. It has filed articles of incorporation, with H. C. Combs, T. C. Fuller and C. B. Moore as incorporators.

The Chicago, Ottawa & Peoria Railroad Co., it is stated, will build an auxiliary steam power plant of 2,000 kilowatts capacity, at Ottawa, Ill. H. E. Chubbuck, Peoria, Ill., is general manager.

The Wills & Marvin Co., 1125 Broadway, New York, received the award for the boiler house to be constructed at the Metropolitan Museum of Art in Central park, New York. The successful bid was $249,942.

The city of Paris, Ky., has definitely decided to erect an electric light plant, following a favorable report to the council, and the finance committee of that body is now determining the probable cost of the plant.

Plans are being prepared for a new power house and substation for the Long Island Railroad Co., at Cedarhurst, Long Island, N. Y. G. B. Gunn, superintendent of construction, Jamaica, L. I., has charge of the improvement.

J. W. Adams, Chattanooga, Tenn., is organizing the Union Development Co., which is to construct a hydroelectric plant at Bryson City, N. C. The cost of the plant is to be $400,000. It will generate 50,000 horsepower.

The Lilly Coal & Coke Co., West Brownsville, Pa., is taking estimates for a steel tipple and power plant for a new mine at that place to have a capacity of 3,000 tons daily. J. I. Mullen, Fourth avenue, Pittsburgh, is the consulting engineer.

James L. Hawley, Wheeling, W. Va., is planning a new power building, 10 stories, 46 x 157 feet, to be constructed of reinforced concrete. The building will be used for light manufacturing, and will contain its own power plant. Charles W. Bates, Wheeling, is the architect in charge of the work.

New Construction

D. A. Burwell, Stovall, N. C., who is planning to establish a plow factory at that place, advises that he has completed arrangements for the necessary building and power plant. He is in the market for plow beams and plow handles, also a hand planer, boring machine and a punching and shearing machine.

The Alma Mfg. Co., 111 Light street, Baltimore, will construct two additional buildings at its present plant, 614-616 South Fulton avenue. The buildings are to be one-story, brick structures. The company manufactures stationary engines. McLaughlin Bros., 915 Bolton street, Baltimore, will erect the additions.

The plant of the Mt. Pleasant Machine Co., Mt. Pleasant, Tenn., has been purchased by the firm of Dugger & Willis, and the machine shop will be enlarged. It is planned to erect a foundry in addition. This will be used to make castings for phosphate mills now being started up in that city.

The Automatic Sprinkler Co. of America, Akron, O., is having plans prepared by Walker & Weeks, 1900 Euclid avenue, Cleveland, for a one-story manufacturing building, 235 x 400 feet. The matter of new equipment has not yet been definitely decided, but it is believed that some new pipe-cutting machinery will be required.

The Westinghouse Electric & Mfg. Co. will erect another building at East Pittsburgh, Pa., bids having been requested. The proposed building is described as an oil storage structure three stories high and with a basement. It will be built of reinforced concrete, cost about $100,000, and will be 70 feet x 161 feet.

Sir William Mackenzie and Sir Donald Mann, of the Canadian Northern railroad, are contemplating the establishment of a plant at Port Mann, British Columbia, for the manufacture of pig iron. Robert Flaherty, a mining engineer in their employ, has been sent to report on the possibilities of the iron industry in British Columbia.

It is understood the American-Dartium Steel Casting Co., Kansas City, Mo., will erect a plant in Kansas City, for the manufacture of converter and crucible steel castings. At first a building 50 x 90 feet will be erected, to be followed by another 80 x 150 feet. Edward Richards, Finance building, Kansas City, is engineer.

The Suburban Motor Car Co., Detroit, has purchased an acreage in Ecorse, a suburb, and will break ground April 1 for an extensive group of factory buildings. The company is capitalized at $500,000, with William A. De Schaum as vice president and general manager. A model industrial village is planned for employes of the new plant.

The Evinrude Motor Co., 213 Reed street, Milwaukee, has awarded contracts for the erection of a new factory on Walker street, between Clinton and Reed streets, to cost $25,000. It will be of reinforced concrete construction, 75 x 140 feet, two stories, with foundation for three stories. Only a small list of tools will be needed, as the equipment of the present plant will be utilized and no extensive purchases of additional machinery will be necessary.

The Tomahawk Iron Works, Tomahawk, Wis., has changed its corporate title to the Tomahawk Steel & Iron Works. The capital has been increased from $15,000 to $30,000, and important extensions are to be made. The exact nature of the plans is not announced, but it is known that a large addition is contemplated, and the present shops will be converted into a steel plate factory for the production of boilers, tanks, etc.

The Lake Shore railroad, through a staff of engineers, has begun preparations for preliminary work for car shops which the road is to build at Air Line Junction, O., near Toledo. They will be capable of handling from 300 to 400 cars a day. Nearly 30 more tracks will be laid to accommodate the assembling of freight and the output of the shops. Work of erection will begin as soon as the weather permits. The entire outlay will entail about $2,500,000.

The Pfannmueller Engineering Co., 3701 South Ashland avenue, Chicago, for some months has been negotiating with interests in Jersey City, N. J., for land on which to erect a duplicate of its Chicago warehouse. J. M. Taft, vice president and treasurer of this company, has practically concluded the deal, and it is hoped to start construction early in May so that the new branch will be ready for business early in the fall.

The Globe Malleable Iron & Steel Co., Syracuse, N. Y., whose plant was damaged by fire on Jan. 23, has begun work of rebuilding, and hopes to resume operations by the middle of May. The main building will be larger than the old plant. The dimensions will be 106 feet x 540 feet. There will be several outside structures for pattern making, store and boiler houses. All the buildings will be of cement and steel construction. The new plant and equipment will cost about $100,000.

The Napanee Iron Works, Ltd., Napanee, Ont., advises that it has been formed to take over the business of the Dominion Rock Drill Co., Ltd., Napanee, whose premises were found to be too small. The new company is erecting large steel and brick buildings for the manufacture of contractors' supplies, such as hoists, rock drills, derrick fittings, dump cars, etc. The equipment required will be foundry cupola, ladles, etc., boiler shop machinery complete, some machine shop tools and supplies.

The Meilink Mfg. Co., Toledo, O.,

expects to move from its present location, Jackson and Tenth streets, to its new plant at the junction of Oakwood avenue and the Lake Shore railroad, about July 1. The site contains two one-story structures and these will be extended, giving the company 32,000 square feet of floor space, besides 12,000 square feet in the storage sheds. The building will have a valuation of $100,000. The company, manufacturer of safes, employs 150 men. It recently voted to increase its capital stock from $50,000 to $150,000.

The Sterling Mfg. Co., 240 Byrne building, Los Angeles, Cal., advises that it has just taken over the plant of the A. S. O'Neil Co., at 1640 San Fernando street, Los Angeles, and work will at once begin on extensive enlargements. The plant at present is completely equipped for structural steel fabrication and includes a brass and gray iron foundry. The company is adding to this equipment sheet metal, tubular and brass goods, to be used in the manufacture of "Very Best" oil cans and a line of standard goods of a similar nature.

The International Hoist Co., Antigo, Wis., has purchased four acres on the Chicago & Northwestern tracks in Antigo, and the board of directors has been authorized to proceed with the establishment of a new plant, as previously noted in THE IRON TRADE REVIEW. The sum of $20,000 has been set aside for the construction and equipment of the new buildings. The present plant will be abandoned, but the equipment will be utilized in the new works. The company manufactures gasoline engines, contractors' and loggers' hoists, elevators, sand sifters and paper balers. It is a consolidation of the International Hoist Works and the Pioneer Iron Works of Antigo.

Miscellaneous

Carrollton, Ky., is considering improving its water plant by the installation of a high power pump. Bids will be received about April 1, by William Bergen.

The Penn Auto Co., New Castle, Pa., which is installing machinery and equipment in its new plant, is expected to begin operations in about two weeks.

The Owens Eastern Bottle Co. has purchased a site of 17 acres near Clarksburg, W. Va., and plans for a large bottle manufacturing plant on this site are being prepared, which, it is estimated, will cost $500,000.

Adams Bros., Hickman, Ky., are planning to make improvements in the shops of the Hickman Motor Works, recently purchased from Hale & Carruthers. The repair of motor boats will be made a feature.

The Nashville Bridge Co., Nashville, Tenn., will purchase a rock crusher with a capacity of 60 cubic yards and a gasoline pump capable of delivering 500 gallons of water per hour at an elevation of 120 feet.

The Sutherland Automatic Air Appliance Co., Louisville, Ky., plans to make a patented automobile brake. The concern has been incorporated with $10,000 capital stock by Luke Sutherland, Cad Burba and M. W. McGrath.

The Janesville Electric Co., Janesville, Wis., has purchased a 500-kilovolt-ampere Parsons type steam turbine generator for the city power plant from Allis-Chalmers Co., Milwaukee. The turbine generator will be geared to run at 3,600 revolutions per minute and produce 700 horsepower, alternating current being delivered at 2,300 volts.

Robert Cooper, county clerk, Welland, Ont., will receive tenders up to April 2 for road machinery for Welland county, including two steam rollers, capacity about 10 tons each; two portable rock crushers, capacity of 10 tons per hour; two portable bins for stone storage, 25 tons capacity; two revolving screens and two chain elevators; two large road graders; two sprinkling wagons and one traction engine of 18 horsepower.

The Tennessee Jellico Coal Co., which was recently incorporated in Louisville, with $300,000 capital stock, will have headquarters at Knoxville, Tenn., and will take over coal properties at Block and Anthras, Tenn., already in operation. A coal tipple and washer are to be installed and the capacity of the mines increased. Robert Wedekind, Louisville, is one of the leading stockholders.

The Westinghouse Electric & Mfg. Co. has received an order from the Southern Pacific railroad for six Baldwin-Westinghouse locomotives to be operated on 600 and 1,200 volts; also for 20 car equipments, wth 450-horsepower motors each, together with all other electric requirements, for 20 Pullman cars which the Southern Pacific has ordered from the Pullman Co., of Chicago.

The Provident Coal Co., operated by Pickands, Mather & Co., Cleveland, will start work in about one month on the opening of about 800 acres of coal land one mile north of Fairpoint, on the Cleveland, Lorain & Wheeling railroad, in Belmont county, O. A tipple will be erected and mine cars and locomotives, conveying machinery, etc., will be required. A bridge will also be constructed across Wheeling creek to reach the railroad. None of the contracts have been let.

Earnings of the United States Steel Corporation by Months and Quarters from Jan. 1, 1907, to Dec. 31, 1911

MONTH	1907	1908	1909	1910	1911
January	$12,838,703.25	$5,052,743.24	$7,262,605.62	$11,316,013.95	$5,869,416.35
February	12,145,814.95	5,709,427.64	7,669,335.70	11,616,861.41	7,180,928.04
March	14,137,973.85	7,466,834.23	7,989,327.43	14,684,001.20	10,468,858.90
First Quarter	39,122,492.05	18,229,005.11	22,921,268.75	37,616,876.56	23,519,203.29
April	14,600,837.97	6,761,680.59	8,163,244.48	13,414,956.00	9,412,572.79
May	16,056,832.06	6,021,278.73	9,661,227.76	13,229,289.14	9,590,443.99
June	14,846,034.82	7,482,796.54	11,516,019.38	13,526,715.69	9,105,503.45
Second Quarter	45,503,704.85	20,265,755.86	29,340,491.62	40,170,960.83	28,108,520.23
July	13,804,167.34	8,599,630.15	12,530,769.84	12,132,188.06	8,750,467.08
August	15,279,172.67	9,152,311.13	12,437,754.28	13,132,755.35	10,710,144.66
September	14,720,945.15	9,354,333.42	13,278,383.31	12,100,243.84	10,062,112.84
Third Quarter	43,804,285.16	27,106,274.70	38,246,907.43	37,365,187.25	29,522,724.58
October	17,052,210.70	9,415,667.63	14,048,205.13	10,512,130.67	9,159,338.87
November	10,467,252.60	8,756,728.90	13,711,764.67	8,228,857.08	6,946,716.82
December	5,014,728.36	8,074,278.37	13,222,776.34	7,160,742.12	7,048,962.08
Fourth Quarter	32,534,191.66	26,246,674.90	40,982,746.14	25,901,729.87	23,155,017.77
Total for Year	$160,964,673.72	$91,847,710.57	$131,491,413.94	$141,054,754.51	$104,305,465.87

RAIL QUALITY

Discussed and Committee of Railway Men and Rail Makers Appointed.

A second conference upon the question of the improvement of steel rail quality was held at the headquarters of the American Railway Association, 30 Vesey street, New York City, March 21, by representatives of the rail manufacturers and of the railroads of the country. At this meeting, there were in attendance the joint committee, composed of nine presidents of the rail-making companies and of the members of the executive committee of the American Railway Association, which was appointed for further consideration of the question at a preliminary meeting called by Chairman E. H. Gary, of the United States Steel Corporation, and held at New York, Feb. 15. In addition to the members of the committee, experts of both the steel companies and the railroads were in attendance.

The meeting was in session until the early evening and the question of rail quality in all its different aspects was considered from the viewpoint of both user and manufacturer. At the conclusion of the meeting, President Daniel Willard, of the Baltimore & Ohio railroad, who presided, announced in conjunction with Chairman E. H. Gary, of the United States Steel Corporation, that a sub-committee of six, to consist of three representatives of the railroad companies and three representatives of the steel companies, had been named to carry the problem to a final solution. In this committee has been vested the consideration of the whole subject of rail quality with the authority to present their conclusions and recommendations at a future meeting of the general chairman. The personnel of this committee will be made public in a few days.

The formal statement covering the deliberations of the meeting as given out by Messrs. Willard and Gary, is as follows:

A meeting of the joint committee heretofore appointed by the railroad companies and manufacturers at the meeting held Feb. 15, was in session during the entire day. A full and frank discussion of the questions relating to the character and wearing qualities of rails was had and the opinions of experts received and considered.

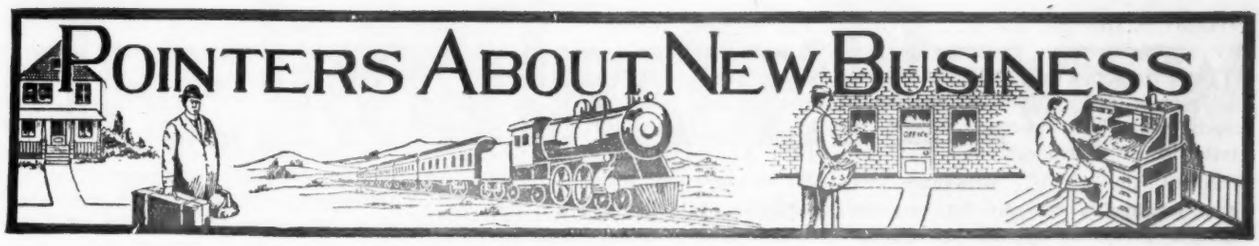
The questions of mill practice in manufacturing rails and usage of the rails in tracks were discussed and it was conceded that improvements can and ought to be made by both sides. Every reasonable effort will promptly be made in this direction.

Important facts were gathered together and much benefit will be derived as the result of the meeting. Before adjournment, a sub-committee of six was appointed, consisting of three representatives of the railroad companies and three representatives of the manufacturers, to consider the whole subject matter and report their conclusions and recommendations at a future meeting of the general committee to be called by the chairman.

At the conference, the presidents of the manufacturing companies, who were in attendance as members of the joint committee, were: E. A. S. Clarke, of the Lackawanna Steel Co.; Jas. A. Farrell, of the United States Steel Corporation; A. C. Dinkey, of the Carnegie Steel Co.; G. G. Crawford, of the Tennessee Coal, Iron & Railroad Co.; Chas. S. Price, of the Cambria Steel Co.; E. C. Felton, of the Pennsylvania Steel Co., and E. J. Buffington, of the Illinois Steel Co. Mr. Schwab, of the Bethlehem Steel Co., was unable to be present. The members of the executive committee of the American Railway Association, which, as such, are members of the joint railway committee, who were either present or represented, were: Mr. Willard; H. U. Mudge, president of the Chicago, Rock Island & Pacific railroad; W. G. Besler, vice president and general manager of the Central Railroad of New Jersey; G. L. Peck, general manager of the Pennsylvania Lines west of Pittsburgh; T. E. Clarke, assistant to the president of the Delaware, Lackawanna & Western railroad; Fairfax Harrison, president of the Chicago, Indianapolis & Louisville railroad; B. F. Bush, president of the Missouri Pacific railroad; J. Kruttschnitt, director of maintenance and operation Union & Southern Pacific railroads; H. E. Byram, vice president of the Chicago, Burlington & Quincy railroad; L. F. Loree, president of the Delaware & Hudson Co.; A. W. Sullivan, chairman of the committee on railway mail pay; Stuyvesant Fish, director of the Missouri, Kansas & Texas railroad; W. C. Brown, president of the New York Central Lines; F. A. Delano, president of the Wabash railroad.

Production of the U. S. Steel Corporation

PRODUCTS	1911	1910
IRON ORE MINED	*Tons*	*Tons*
In the Lake Superior Ore Region		
Marquette Range	560 685	830 094
Menominee Range	1 105 044	1 384 465
Gogebic Range	1 264 734	1 801 480
Vermilion Range	1 182 075	1 338 110
Missabe Range	14 581 530	17 910 366
In the Southern Ore Region		
Tennessee Coal, Iron & R. R. Co.'s Mines	1 239 563	1 981 301
Total	19 933 631	25 245 816
COKE MANUFACTURED		
In Bee-Hive Ovens	9 491 206	11 641 105
In By-Product Ovens	2 629 006	2 008 473
Total	12 120 212	13 649 578
COAL MINED, not including that used in making Coke	5 290 671	4 850 111
LIMESTONE QUARRIED	4 835 703	5 005 087
BLAST FURNACE PRODUCTION		
Pig Iron	10 593 726	11 645 510
Spiegel	66 435	102 260
Ferro-Manganese and Silicon	84 736	83 628
Total	10 744 807	11 831 398
STEEL INGOT PRODUCTION		
Bessemer Ingots	5 055 696	5 796 223
Open Hearth Ingots	7 697 674	8 383 146
Total	12 753 370	14 179 369
ROLLED AND OTHER FINISHED STEEL PRODUCTS FOR SALE		
Steel Rails (Heavy and Light Tee and Girder)	1 568 028	2 118 473
Blooms, Billets, Slabs, Sheet and Tin Plate Bars	874 474	682 364
Plates	630 512	939 020
Heavy Structural Shapes	547 186	656 797
Merchant Steel, Bars, Hoops, Bands, Skelp, Etc.	1 221 606	1 527 506
Tubing and Pipe	863 670	868 550
Wire Rods	118 302	133 722
Wire and Products of Wire	1 613 754	1 490 318
Sheets (Black and Galvanized) and Tin Plate	1 079 046	1 082 787
Finished Structural Work	518 399	589 228
Angle Splice Bars and All Other Rail Joints	160 855	235 998
Spikes, Bolts, Nuts and Rivets	60 386	71 326
Axles	52 046	101 066
Steel Car Wheels	36 652	98 105
Sundry Steel and Iron Products	131 332	148 735
Total	9 476 248	10 733 995
Spelter	28 333	26 777
Sulphate of Iron	28 381	33 684
	Bbls.	*Bbls.*
Universal Portland Cement	7 737 500	7 001 500



New Buyers

(In order to assist the post office in delivering letters to new concerns, it is suggested that the names of incorporators be written in the lower left hand part of every envelope addressed to such new companies.)

The following manufacturing companies have filed articles of incorporation:

The Dow-Mirrlees-Diesel Engine Co., San Francisco; $750,000; by J. T. O'Connor and G. E. Nolan.

Philipp-Kell Co., Baltimore; $10,000; by Edgar C. Philipp, Ernest A. Philipp, Henry Philipp, all of 423 North Calvert street.

Tulsa Sheet Metal Co., Tulsa, Okla.; $2,000; by Thomas J. Byrne, William Risherbarger and Gertrude T. Risherbarger.

Nashold Centrifugal Machinery Co., Davis Junction, Ill.; $100,000; to manufacture machinery; by Menzo Nashold, Earl Gould, Leonard Knott.

The Lee & Parr Hardware Co., Clarksburg, W. Va.; $19,000; to manufacture hardware; by C. W. Lee, W. G. Parr, B. Parr and F. O. Sutton.

The Verdin, Kappes & Verdin Co., Cincinnati; sheet metal working machinery; $25,000; W. H. Kappes, I. T. Verdin, H. A. Bolsinger, Eugene Adler, John Bolsinger.

The Leach Norman Hardware Co., Star, N. C.; $20,000; to manufacture hardware; by E. Leach, J. Leach, Star, N. C., and J. C. Norman, Statesdale, N. C.

The Reno-Kaetker Electric Co., Cincinnati; $15,000; to manufacture electrical machinery; by Frank P. Colville, Henry Kaetker, Stanley Parvin and Lena L. Light.

The Acme Register Co., Somerville, Mass.; $500,000; by Frank L. White, Middleboro; Henry J. Roberts, South Boston, and Delevan C. Delano, Carney building, Boston.

The United States Envelope Sealing Machine Co., Springfield, Mass.; $50,000; by Carl H. Davis, E. Longmeadow and Clarence H. Green, Springfield.

The New Bremen Bridge Co., New Bremen, O.; $10,000; by J. H. Grothaus, Wm. Grothaus, John Schwege, Aug. Laufersieck, Fred Laufersieck Jr.

The Standard Electric Tool Co., Cincinnati; $10,000; to manufacture machine tools and electric appliances; by Frank H. Kunkel, Earl W. Griffin, Frank P. Hamilton, H. L. Aischolz and Marston Allen.

The Southern New England Engineering Corporation, Bridgeport, Ct.; $2,000; to manufacture machinery; by Chas. L. Gulick, Bridgeport; John H. Faraday, Arlington, N. J., and Morgan L. Parks, Closter, N. J.

The Cleveland Metal Joint Co., Cleveland; $35,000; to manufacture metal joints for pipes and cables; by Richard M. Corcoran, P. H. Sugrue, Henry W. Lammert, Edward L. Krieg, J. A. Lammert.

The Cash Register Co., New York City; $10,000; to manufacture cash registers; by Raphael Freedman, 16 West 117th street; Edward Sher, 1344 Park avenue; John G. Keeler, 7 East 129th street, all of New York City.

The Cleveland Automatic Clock Co., Cleveland; $250,000; to manufacture automatic clocks and automatic lighting devices; by H. P. Shupe, C. A. Bond, F. L. Fuller, R. G. Floyd and M. R. Brailey.

The Clifton, Pratt Co., Cincinnati; $10,000; to manufacture pumps, vacuum cleaners and other machinery and supplies; by A. E. Clifton, Charles R. Pratt, A. H. Evans, Edward S. Macneale and Guy W. Mallon.

The Enterprise Metal Bedstead Co., New York City; $20,000; to manufacture metal bedsteads; by B. Schwartz, 104 Columbia street, and Harry Bazzar, 280 Stanton street, Brooklyn, and Max Feldesk, 11 West 117th street, New York City.

General Industrial

The Richmond Structural Steel Co., Inc., Richmond, Va., has increased its capital stock to $150,000.

Work on rebuilding the Star furnace at Jackson, O., was commenced early this month.

The United States Pressed Steel Co., Ypsilanti, Mich., has increased its capital stock from $25,000 to $50,000.

The annual meeting of the Central Foundry Co. will be held April 11, at Portland, Me.

The Keeton Motor Car Co., Detroit, has been incorporated with a capitalization of $10,000, which will later be increased to $275,000.

The Lucknow Iron Co. expects to resume operations at its plant in Pine Forge, Pa., by April 1. It was closed down several weeks ago when receivers took charge.

The B. Bell & Son Co., Ltd., St George, Ont., manufacturer of farm implements and machinery, advises in reference to establishing a plant in the United States that this project is very indefinite at present.

The capacity of the hardening and tempering department of the Dunbar Bros. Co., Bristol, Conn., has been practically doubled and furnaces have been installed which are especially adapted for testing vanadium steel springs.

The Hope Bridge & Iron Works, Hope, Ark., has been incorporated with Taylor H. Allen, Albert F. Annon and H. J. Price as the incorporators. The company has already secured some county bridge contracts.

The firm of Joseph Wodsedalek & Co., Algoma, Wis., manufacturer of gas engines and operating a foundry and machine shop, has been dissolved and the business will be continued alone by Mr. Wodsedalek.

H. F. Frauenheim has been appointed receiver for the Vanadium Mines Co., and stockholders of this company are arranging plans for a reorganization. The company's operations are located in New Mexico, but the principal stockholders live in Pittsburgh.

The Wellman-Seaver-Morgan Co., Cleveland, has been awarded a contract by the Ontario Power Co., Niagara Falls, Can., for a 14,000-horsepower hydraulic turbine unit which is to consist of two Francis type central discharge wheels. Heretofore, this company has always purchased European-built apparatus.

The Buffalo-Ontario Smelting & Refining Co., Ltd., Kingston, Ontario, advising in regard to its recent incorporation, says that it is changing over an old plant in Kingston in which to treat lead, silver and gold ores coming from the company's properties. The proposition, therefore, has nothing to do with outside organizations.

The Wilson-Snyder Centrifugal Pump Co. has applied for a charter at Harrisburg, Pa., with Henry D. Wilson,

Thomas D. Gillespie, and H. S. McKinley as incorporators, for the purpose of manufacturing and selling centrifugal pumps, engines, turbines and other machinery. The incorporators are all residents of Pittsburgh.

Allis-Chalmers Co., Milwaukee, has been awarded a contract for two centrifugal pumps by the city of Chicago for a sum of $25,106.

The Texas Foundry & Machine Co., Dallas, Tex., has been incorporated by E. B. Boland, R. W. Marple and J. H. Durkee, for $10,000, to engage in the general foundry and machine shop business.

The Rock Island Bridge & Iron Works has been incorporated and located in Rock Island, Ill. It is capitalized at $30,000. The incorporators are M. H. Kanary, Walter G. Murphy and Edward Manhard. The company will fabricate and erect structural steel.

Machinery will be required soon by the Williams Coal & Coke Co., Paintsville, Ky., which has been incorporated with $300,000 capital stock and will shortly begin extensive developments of coal lands in Eastern Kentucky. John C. C. Mayo and John F. Hager are the principal stockholders.

The American Zinc, Lead & Smelting Co., Boston, will establish a smelting plant at the Tennessee property, recently acquired. Arrangements have been completed for disposing of a sufficient amount of stock for financing the improvement, which, it is estimated, will cost about $500,000, including equipment.

J. A. Rose has built and equipped a brass supplies foundry at Hastings, Neb. The plant will be used as a general machine shop and novelty works and will cast brass for all kinds of work. The Rose washer cutter will also be manufactured at the plant as well as a patented meter connection and a patented set of drift punches.

The Smythe Construction Co., Pittsburgh, has completed its work in overhauling the furnace of the Sweet's Steel Co., Williamsport, Pa. The furnace was fired last week for the first time in several months. The furnace in the open-hearth department will be repaired next and when completed manufacture of steel will be started.

The Floyd circuit court, of New Albany, Ind., has set April 20 as the date for receiving bids on the plant of the American Automobile Mfg. Co., of that city. The company is now in the hands of a receiver, the New Albany Trust Co., which will receive the bids. It is expected that a corporation organized by the stockholders will take over the property.

The name of the Chicago Brass Co., Kenosha, Wis., has been changed to The Kenosha Branch of the American Brass Co. Plans are being made for the erection of a large rod mill. The new officers are: President, Charles F. Brooker; assistant to the president, John A. Coe Jr.; manager, George H. Allen; assistant manager, Clifford J. Hackett.

The Power Plant Machinery Co., Cleveland, advises that it has been incorporated for the purpose of representing power plant machinery builders. The company is working along conservative lines and will not require any buildings, plant or equipment for the present. George W. Bach, its president, was for five years with the Great Lakes Coal Co., Pittsburgh, doing evaporation test work, and acting as coal expert and selling coal.

Edward R. Stettinius, president of the Diamond Match Co., and Walter Updegraf, a stockholder, have been appointed receivers for the McCrum-Howell Co., Chicago, on proceedings brought in federal court in that city and Philadelphia. An estimated financial statement, dated March 8 last, places the assets at $3,122,000 and liabilities at $2,118,000. The company is capitalized at $7,000,000, half common and half preferred stock and no bonds.

Contracts have been awarded by the Sharon Clay Products Co., Sharon, Pa., for one brick machine with a capacity of 70,000 bricks a day, two pug mills with a capacity of 36,000 pounds each a day, two repressing machines and one cutter. The order went to the Bonnot Co., Canton, O. The Sharon company is remodeling its plant recently purchased from the Rose State Line Brick Co., and is putting in new rail connections. It is taking out a charter under the laws of Ohio.

The Westinghouse Electric & Mfg. Co. last week took an order for six electric locomotives, each weighing 55 tons and having a capacity of 108 horsepower, to be operated by the Piedmont Traction Lines of North and South Carolina. The locomotives will be unique in that they operate on 1,500 volts, direct current, the highest direct current voltage ever used in this country for railroad locomotives. The new machinery will have a capacity for hauling 40 freight cars of 45 tons each, wth a speed of 20½ miles per hour on level track. The Baldwin Locomotive Works will supply the locomotive frames and cabs which will be of steel.

Joseph T. Ryerson & Son, Chicago, report that business since the first of the year indicates a considerable improvement in the volume of machinery buying. A very excellent demand has developed for individual tools and a large number of complete equipments, that will be closed within the next few months, are being figured on. Since the first of the year, the company has booked a number of complete equipments for the following firms: Barnard & Leas, Moline, Ill., Chicago & Alton Railroad Co., Bloomington, Ill., Finucane Boiler Works, Houston, Tex., Denver Boiler & Iron Works, Denver, Colo., Oklahoma City manual training school, Oklahoma City, Okla., etc.

Trade Notes

Scully-Jones & Co., Railway Exchange building, Chicago, have been appointed exclusive agents for Elco high-speed steel, manufactured by Vickers Sons & Maxim, Ltd., Sheffield, Eng., for the states of Illinois, Indiana, Iowa and Wisconsin.

The Price Electric Co., 413 Sibley street, St. Paul, Minn., announces that it has completed an arrangement with the Ideal Electric & Mfg. Co., of Mansfield, O., to represent the latter company. A large stock of Ideal motors, generators, etc., will be carried.

The Shenango Furnace Co., Pittsburgh, has found it necessary to open a Cleveland office, which has been situated on the 16th floor of the Rockefeller building. W. F. Riley, formerly fleet engineer of the Shenango Steamship Co., Snyder's fleet, has been promoted to superintendent of the Snyder interests and will have charge of the operation of the boats. C. J. Peck, Washington, D. C., has been appointed assistant fleet superintendent in charge of traffic.

Fires

The plant of the Allsop Process Co., St. Louis, was recently damaged by fire to the extent of $4,000.

The plant of the Canton Brass & Machine Co., Canton, O., was recently damaged to the extent of $3,000 by fire.

Damage estimated at $2,000 was done to the supply house of the Struthers Furnace Co., Struthers, O., on March 18. The loss is covered by insurance.

Fire recently caused heavy damage at the plant of the Cliff-Williams Machine Co., Meridian, Miss. The loss is reported to be over $100,000.

Fire at the plant of The Sessions Foundry Co., Bristol, Conn., damaged the smaller of the pattern storage buildings on the night of March 16. The larger part of the patterns belonging to the company's customers and those of the company itself were not lost. The plant will continue in operation without interruption. The damaged building will be replaced immediately with a larger and fireproof structure.